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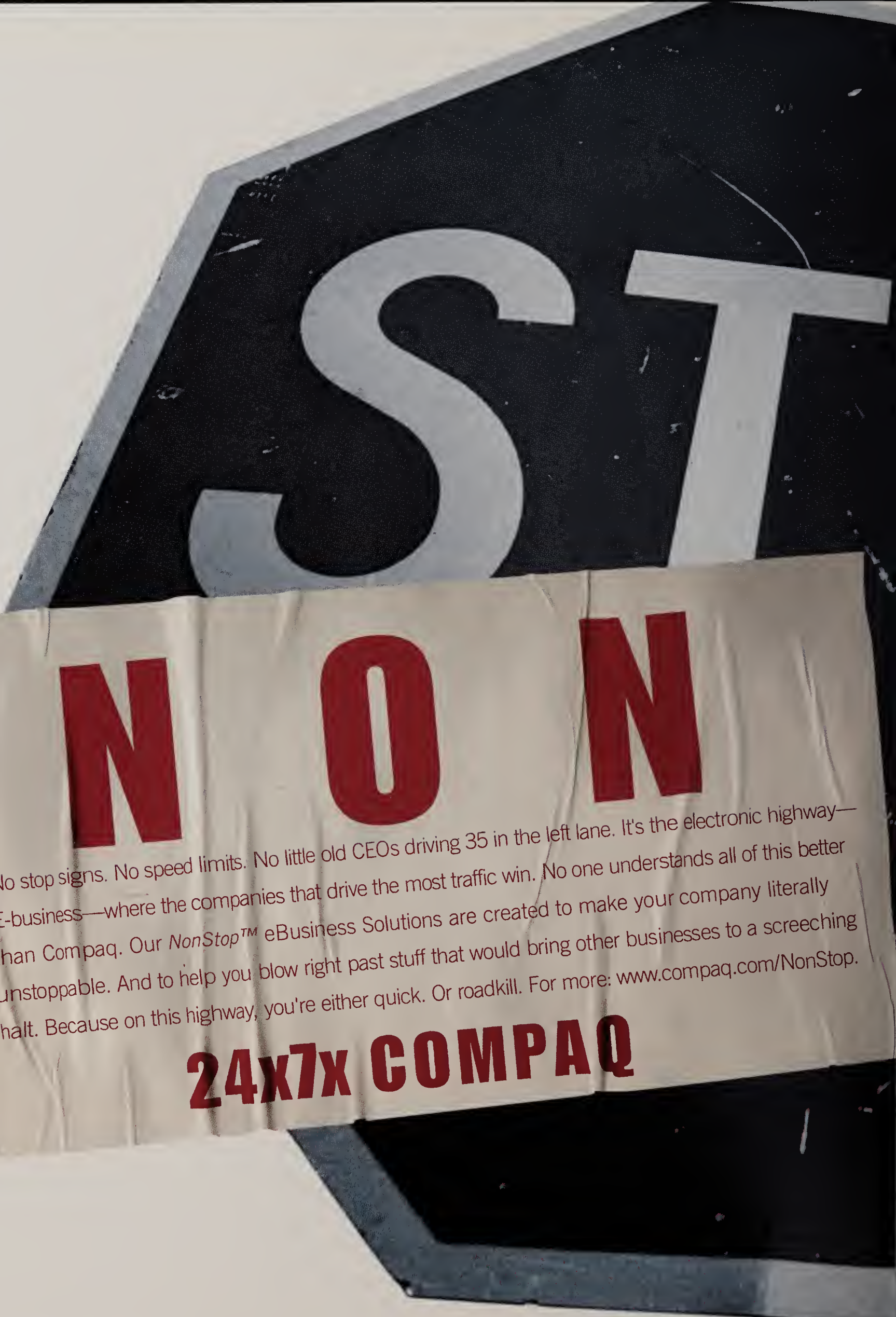
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Roundtable**

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ERP QUAKE!

**Enterprise resource planning
is shaking up your entire business.
Your survival guide begins on Page 38.**



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3-D illustration and photography by Bruce Strachan



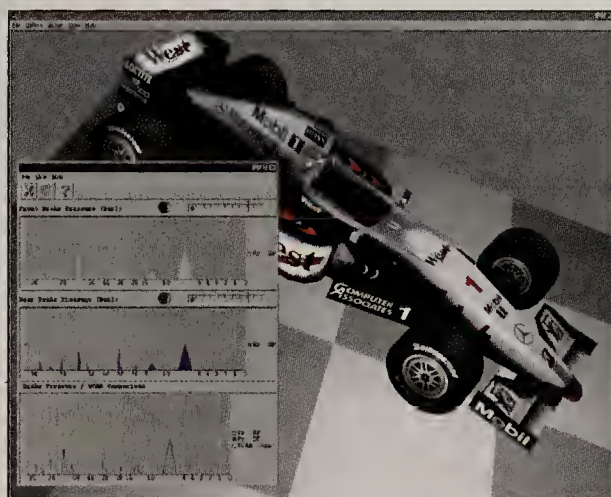
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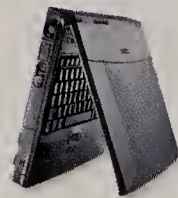
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REALITY BYTES Lazy e-commerce practitioners may go the way of the milkman.

EXECUTIVE SUITE Rex Martin says the pain of a major IT implementation is worth it.

INTELLECTUAL CAPITALISM Merging companies that fail to integrate intellectual assets may be squandering the value of the merger.

LEARNING CURVE Link more computers to process more of your workload.



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In Box

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

It's hard to fathom that one of the most significant movements in information systems over the past five years has had nothing to do with the Internet. But as our cover image so dramatically suggests, enterprise resource planning is having a profound and foundation-shaking effect on the business landscape.

If you think ERP is just for a small subset of businesses, consider this: SAP, the leading ERP vendor, boasts 20,000 installations and 10 million users worldwide—and that's still only 30 percent of the overall ERP market.



There are many reasons ERP has proven to be such a powerful force. It was a logical solution to the mess of incompatible applications that had sprung up in most businesses; it addressed the need for global information sharing and reporting; and in many cases it was used to avoid the pain and expense of fixing legacy systems for Y2K.

More powerfully, ERP as a business concept sounds like internal information-management nirvana: Everyone involved in sourcing, producing and delivering the company's product works with the same data, cutting out redundancies, wasted time and misinformation—who wouldn't want that?

I've long been a skeptic of ERP. It's not that I think the promise was oversold. ERP done right is a substantial advance in using information to run a business. The trouble is, so few people have been able to do it right. For the best insight I've seen yet into why that is so—and how to turn that around—read "The Most Important Team in History," by Senior Editor Christopher Koch, beginning on Page 40.

There are two other problems with the total solution packages. The first is their lack of flexibility. They are so complex and so married to a specific set of processes that they may actually prohibit a business from veering off in a new direction; the software may not be able to shift fast enough to support such a move.

The other problem goes back to the first statement in this column. The major ERP vendors have been slow to move to the Internet. You'd think someone would have realized that once you got all the people inside the company singing from the same hymnal, you'd want to extend that back into the supply chain and forward to your customers as well. In "Can You Do the WWW?" beginning on Page 62, Koch gives us a glimpse at the ultimate acronymned future: SCM-ERP-CRM (for the uninitiated, that's supply chain management, enterprise resource management and customer relationship management)—a truly comprehensive approach to running a business on information.

In the meantime, our special report, "ERP Changes Everything," provides answers to many of the questions ERP survivors wrestle with once their systems go live and the real fun begins.

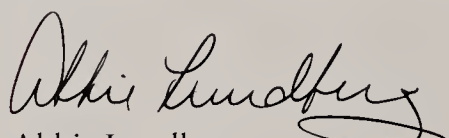
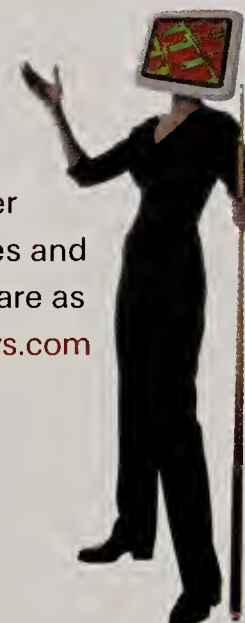

Abbie Lundberg
lundberg@cio.com

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Sometimes a solution comes to us when we're not really working on it. That's what we call a nice break.

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Sound Off

TAKING SIDES ON CRITICAL I.T. ISSUES

Each week, we pose a question on our Web site to our readers and watch the sparks fly. Here are two recent columns and some reader responses. To join the debate, visit comment.cio.com.

How Much Will the Y2K Act Cost You?

July 20, 1999

CHALK UP ANOTHER VICTORY for the high-tech lobby on Capitol Hill. On July 21, President Clinton signed into law the Y2K Act, which, in limiting legal liability for year 2000 computer problems, lets irresponsible software vendors off the hook.

Big business concerns, like the U.S. Chamber of Commerce and the National Association of Manufacturers, laud the cap on frivolous lawsuits that might drain resources from the high-tech sector. Consumer groups worry that limitations will provide little recourse to consumers stuck with products that are not fit for work after this year. And CIOs? Their fate depends on how prepared for Y2K they are.

One provision in the Act mandates a 90-day cooling off period during which a company charged with Y2K negligence can work on the problem before being hauled into court. Three months is a generous grace period for a supplier with delivery problems but a life sentence for a CIO with stalled operations.

Another provision states that plaintiffs may not recover damages for economic loss "unless such losses result directly from damage done to tangible personal or real property caused by Y2K failure." Since U.S. courts have traditionally viewed electronic data as intangible, some experts predict that IS directors will have a hard

time suing for losses caused by corrupted hard drives—a boon for a software vendor but a straitjacket for the CIO who has just lost a business-critical database.

Companies lax in their Y2K remediation efforts will enjoy protection from costly legal action while they hang their business partners out to dry. CIOs who have been diligently readying their systems will have little hope for compensation—except for that required by pre-existing contractual agreements that cover Y2K—when their vendors and suppliers let them down.

And there are other ramifications to the Y2K Act that are even deeper than costs to the bottom line.

For years, CIOs have complained about a software industry that favors time-to-market over careful design. Vendors have known about Y2K for years, and yet, according to Lou Marcocio, Y2K research director at Gartner-Group, "70 percent of currently shipping versions of all commercial software is not Y2K ready." The software industry, which feeds off problems of its own doing, has been in a position to make millions on Y2K upgrades. Now, thanks to the Y2K Act, it will do so with impunity.

But software companies are not the only beneficiaries of this legislation. Any company—software or otherwise—that has failed to assess its Y2K readiness will find some protection under this law. And those companies that have invested big money in remediation efforts are more the fools for having done due diligence.

Our free market practice is supposed to weed out those companies that do not plan ahead, do not think strategically and habitually let down their customers. Yet just as the weaker companies are



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forced to meet their proverbial maker, along comes the government to reward shoddy business practices with protection from legal action.

Call your lawyers, make sure your contracts cover Y2K liability and secure your contingency plans. The system you thought would provide you with legal defense against negligence has been sold out by an administration that is more frightened of the accusation that they spoiled the party, than concerned about the integrity of American business.

How much will the Y2K Act cost you? Plenty.

—Martha Heller, Web Writer

SORRY, BUT IT'S EVEN WORSE THAN Martha Heller predicts. The advantages to defendants under the Y2K Act and similar state legislation are so profound that its benefits may be sought by defendants in cases tangentially related to Y2K, or even cases which simply have some aspect which relates to computing. Keep in mind the utter lack of sophistication about these matters on the part of the judges who'll be called on to decide whether a case relates to Y2K. Call it the "Y2K dog ate my homework" excuse. If it can benefit someone who wants to skate on an obligation, someone somewhere will do it, and if someone gets away with it....

Bill Skeels

President

LawSight.com

Raleigh, N.C.

I TOTALLY DISAGREE WITH MARTHA Heller's opinion on this subject. I think the Y2K Act is needed in our litigation-happy country. If a CIO wasn't buying Y2K-compliant software at least five years ago, then he or she should probably not have the job. CIOs should do their own homework and be responsible for their decisions. If they can't, then they should be fired rather than crying to their CEOs about how the big bad software company took advantage of them.

Barry J. Brunetto

Director of Information Systems

Outdoor Products Group

Blount International Inc.

Portland, Ore.

THERE IS LITTLE DOUBT IN MY MIND that this law will make the software vendors sleep a little better at night...and me, as a customer, sleep a little less.

While I have worked diligently to ensure Y2K compliance, I always felt I had a legal "hammer" to use, just in case. Now that option is all but gone. I will, however, keep good records of which vendors performed well and which didn't. In this industry, a story about a vendor's performance told at a conference or other venue can have a significant impact on that vendor's future sales.

As for costs, I used Y2K as an opportunity to upgrade functionality and to standardize products and databases, so the actual cost would be hard to determine. This, however, is the bright side of Y2K!

Bruce Reirden

Vice President and CIO

Care New England

Providence, R.I.

Can CIOs Make Good CEOs?

July 26, 1999

LAST FRIDAY, EVERYONE WHO read *The New York Times* business section discovered how little faith the world has in the ability of a CIO to lead a large corporation.

The reaction in the *Times* and other major newspapers to Compaq's appointment of Michael Capellas as its new CEO was anything but encouraging. Analysts, the papers reported, were "skeptical" and "disappointed."

They bemoaned Capellas's "lack of star power," and they speculated that with Compaq's executive turmoil, declining market position and Chairman Ben Rosen's reputation for back-seat driving, the board couldn't find anyone else for the job. Desperate, reporters suggested, Rosen turned to a CIO. Even Wall Street offered up a lackluster reception to the news with a \$1 dip in

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Are the analysts right? Is a CIO the wrong choice to lead a company? Or can CIOs become successful CEOs?

Capellas may well be the perfect pick for the job. With nearly 20 years in IT management—most recently as Compaq's own CIO—Capellas certainly has a grasp of IT issues that escape most CEOs. He may even have the know-how to bring Compaq out of the ailing PC market and into enterprise computing. His predecessor, Eckhard Pfeiffer, had a more traditional marketing background, yet was ousted in April for failing to capitalize on the new business and distribution models that are all the rage in the Internet economy. It is arguable that a CIO would not make that mistake.

In a market where technology is transforming distribution channels, sales models and customer service, technological sophistication separates the wheat from the chaff. CEOs who don't get IT aren't up to the challenge. How hard is it to see the wisdom of hiring a CEO who appreciates the power of information technology and knows how to use it? Judging from last Friday's paper, it's too hard for the analysts and the mainstream press.

Can CIOs make good CEOs? Tell us what you think.

—Martha Heller, Web Writer

THE POSITION MOST SIMILAR TO A CEO in an organization is already the CIO. We are sort of the unheralded triple-A baseball manager—all of the

same responsibilities without the publicity. There is nothing we do not touch or influence. There is no department or group that is not affected by our services. We are compelled continually to take risks, evaluate the rewards of the risk and take the leap. Few executives, if any, understand the company simultaneously both from 50,000 feet and 5,000 feet, as does the chief information officer. The real problem is the misguided, short-sighted perception that most of us still don't understand the business. We not only understand the business, we drive it.

Mike Anderson
CIO
Brightpoint Inc.
Indianapolis

GIVE A CIO P&L, BUSINESS TRANSFORMATION and other operational experience like marketing and service, and you have the formula for the most well-

rounded CEO candidate that today's markets require. Mike Capellas will prove this concept.

Ted DellaVecchia
Senior Vice President and CIO
Capital Blue Cross
Harrisburg, Pa.

IT IS LUDICROUS TO THINK THAT A CIO won't make a successful chief executive officer. IT is one of those pervasive things (as you all know) that creeps into almost every aspect of an organization's structure. The consequence is that the IT architect (often the CIO) is fully aware of the strengths and weaknesses of the organization. The issue is not so much whether he can be successful, but whether he is supported by those around him.

Clinton Jones
CIO
LuK Africa Pty. Ltd.
Port Elizabeth, South Africa

SINCE THE CIO IS NEEDED IN ALL departments, he or she usually knows, firsthand, the problems that are internal to the company. But what many CIOs lack is the external view. To become a successful CEO, the CIO must also have knowledge of marketing and sales, acquisition and finance, or the right people around him. If Michael Capellas doesn't succeed, he will set CIOs back 20 years!

Richard Costello
Systems Engineer
Office of the CIO
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Michael Capellas
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Publisher's Note

Last month, CIO's Web Writer Martha Heller and I posted the following thought to the Sound Off column on CIO.com (comment.cio.com):

Should information technology workers be certified? Our thinking was that the new economy of the 21st century will be built on digital pylons. Every aspect of life will in some way be touched by technology, so doesn't it make sense for information technology professionals to go through a certification program that will address the compatibility of hardware platforms, operating systems, programming languages and Internet protocols?

Current IT certification programs are mostly self-serving, vendor-driven efforts designed to educate an IT professional to use the vendor's product. We thought the market needed a third-party certification effort that would verify a broader base of knowledge, hence our idea.

Well, we certainly hit a nerve! Here's just a sample of what you wrote us:

"Standards change every day in this industry, what would you certify?"

"Who needs certification? Just fire programmers who write bad software."

"Certification would cause exclusivity that will further the cause of the rich and widen the class gap—just as education exclusivity does."

"I know many incompetent lawyers, doctors and CPAs."

"Certification would only create unnecessary noise when what we really need is a better signal of people's abilities. Possibly a skills-based private certification program would satisfy this need."

"Let's leave the decision making on quality IT staffing to the people best able to make those decisions—the CIOs."

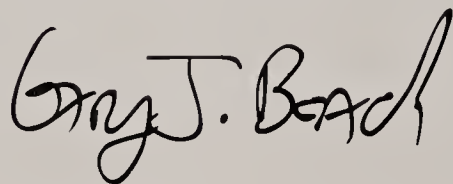
"No matter who does the weeding, there is no substitute for experience."

"Certification will only favor those who are good test takers."

Not all of the respondents panned the idea. Some pointed to the airline pilots who initially fought certification until "they realized that it was a good thing for ensuring safety." And one reader, after viewing the threaded discussion on CIO.com, challenged the group with this comment: "What a bunch of whiners. Are you afraid you will not be able to pass the minimum standards [that] such a test would set forth?"

In the end, it does not matter what IT professionals think about broad-based certification programs. The decision about IT certification will be made by groups outside our industry, and we all need to be prepared for that day.

What do you think? Log on to comment.cio.com and click on "Should IT Workers Be State Certified?" Let's continue the discussion.



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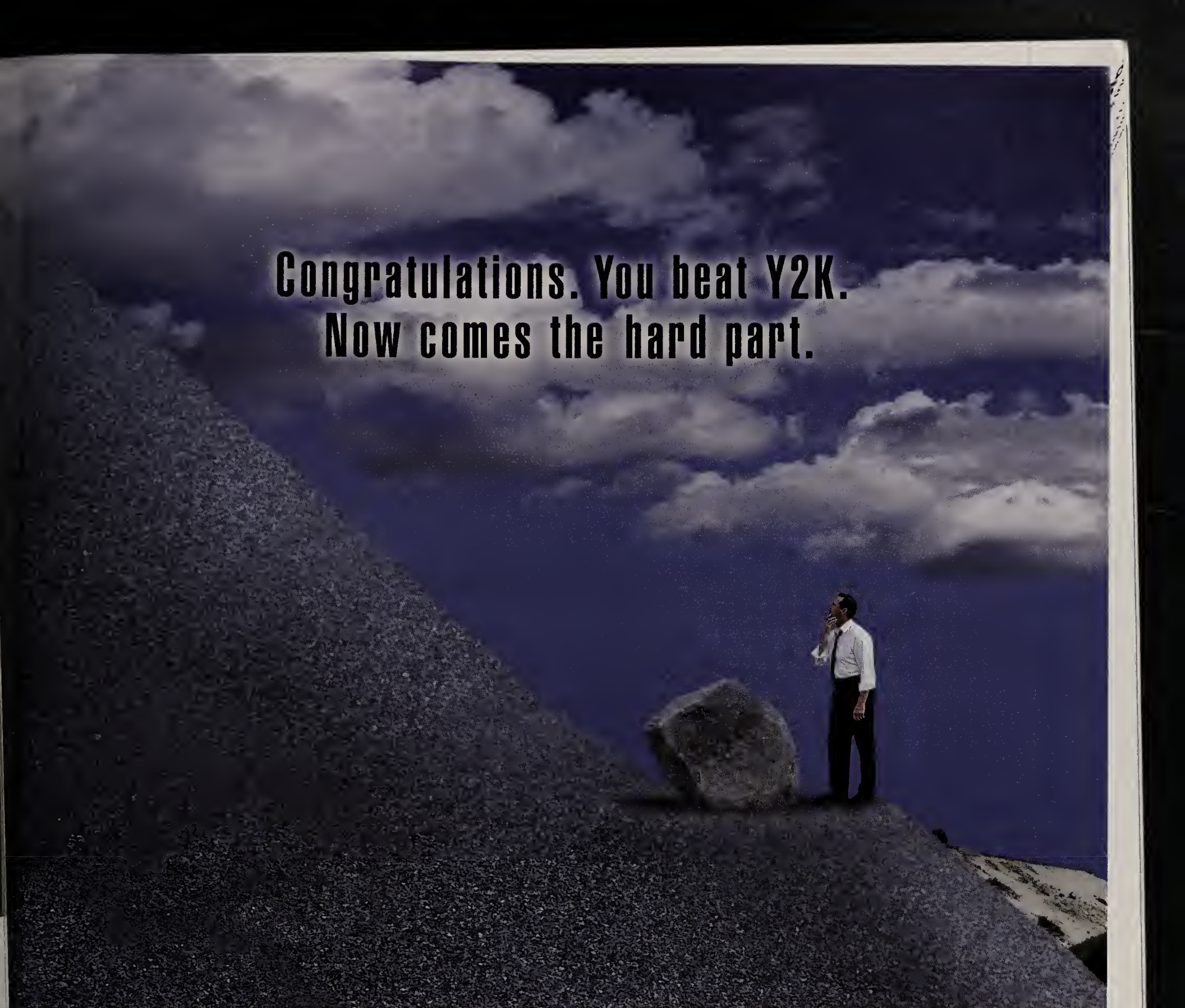
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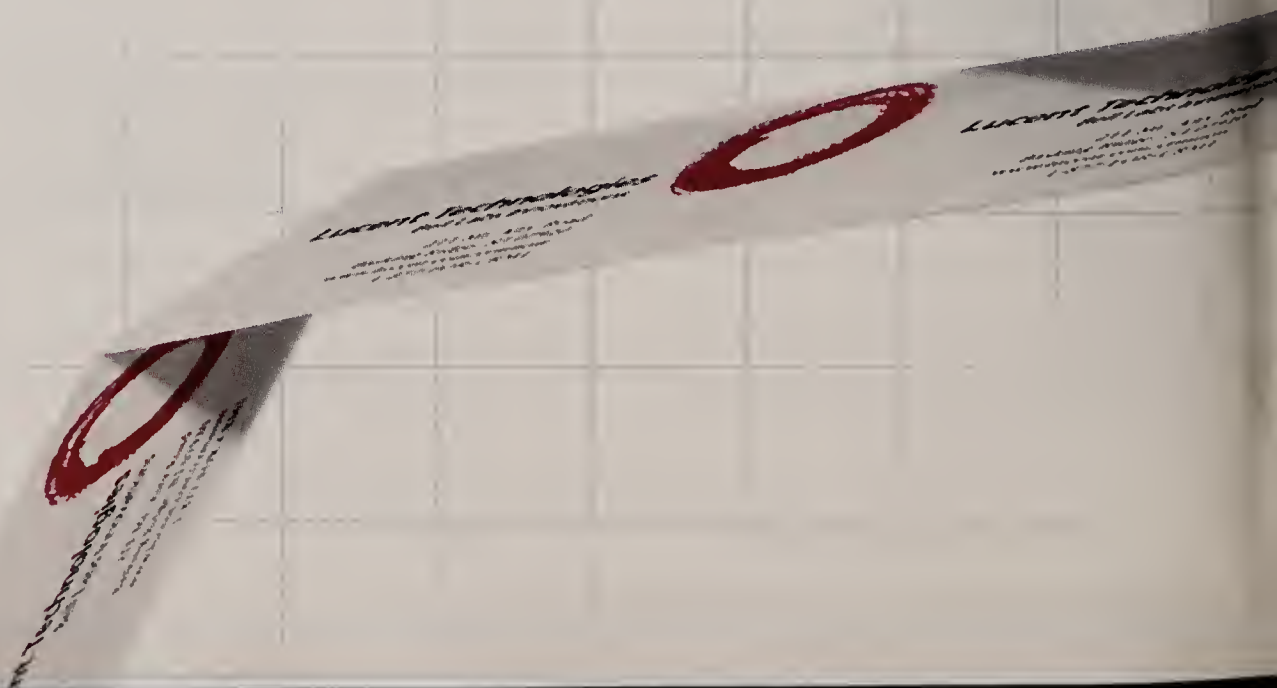
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Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by David Rosenbaum

The Ghost in the Machine



TECHNO TALES The horror, the horror.

Come on kids, circle up around the fire. There's no better way to mark Halloween than with a good old-fashioned horror story. Unfortunately for Jim and Audri Lanford, this one really happened.

Late last year the Lanfords, who run an Internet marketing business called NetRageous Inc. in Olney, Md., launched a new Web site at www.FreeFurby.com. FreeFurby.com rewarded Web surfers for filling out a marketing survey by giving away Furby toys. (No matter what you think of Furbies, we haven't gotten to the scary part yet.)

The Lanfords' goal was to create goodwill for an eventual e-commerce site. In the course of promoting the Furby giveaway, NetRageous contracted with its usual Seattle-based fax broadcasting service to distribute its press releases to 1,100 or so radio stations around the country. So one dark and stormy night, Audri Lanford, CEO of NetRageous, wrote a one-page press release and shipped it off for distribution. Alas, when the broadcasting service began to distribute the release, it included an additional 25 to 500 pages of random typographic marks, all attributed to NetRageous. And the automated system refaxed this compendium of gibberish to the same stations over and over and over again.

Other things were (Continued on Page 22)

Room 404, Where Are You?

GEEK APOCRYPHA So you're browsing the Web and instead of finding the site you want, your screen goes gray and up pops, "404 File Not Found," and you know that means that the page you requested could not be located on the server. You check the URL, check your spelling and move on to the next thing.

But why 404? Why not 403 or 405? Why 40-anything?

The number 404 is a hypertext transport protocol (HTTP) status code. According to the World

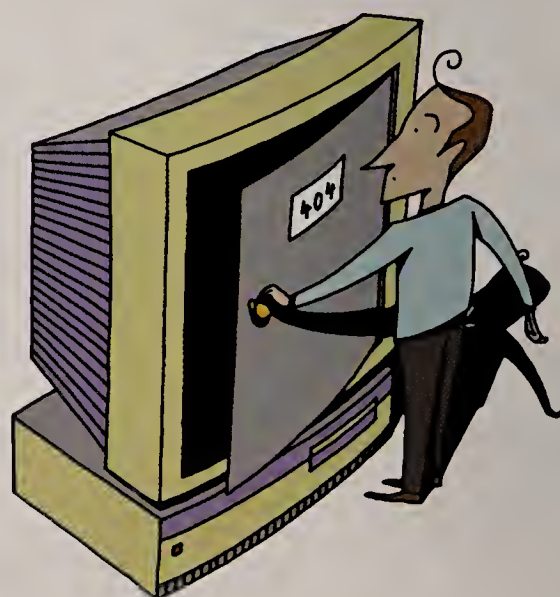
Wide Web Consortium (www.w3.org), HTTP status codes were defined by a team headed by Tim Berners-Lee, the man widely credited with inventing the Web (sorry, Mr. Gore) and the first Web browser at CERN (European Laboratory for Particle Physics, www.cern.ch) beginning in 1990.

Which, of course, does not answer the question.

This from the Web site www.room404.com: When Berners-Lee and the other scientists were at work creating the Web,

any request for a file was routed to a central database where people would manually locate the files and transfer them over the network. When they could not find a file, "usually because the person...typed in the wrong name," the scientists sent back the message, "File Not Found." They prefaced the message with the name of the room where they worked, the room where the data was physically contained—room 404.

Berners-Lee, who is a principal research scientist at the MIT Computer

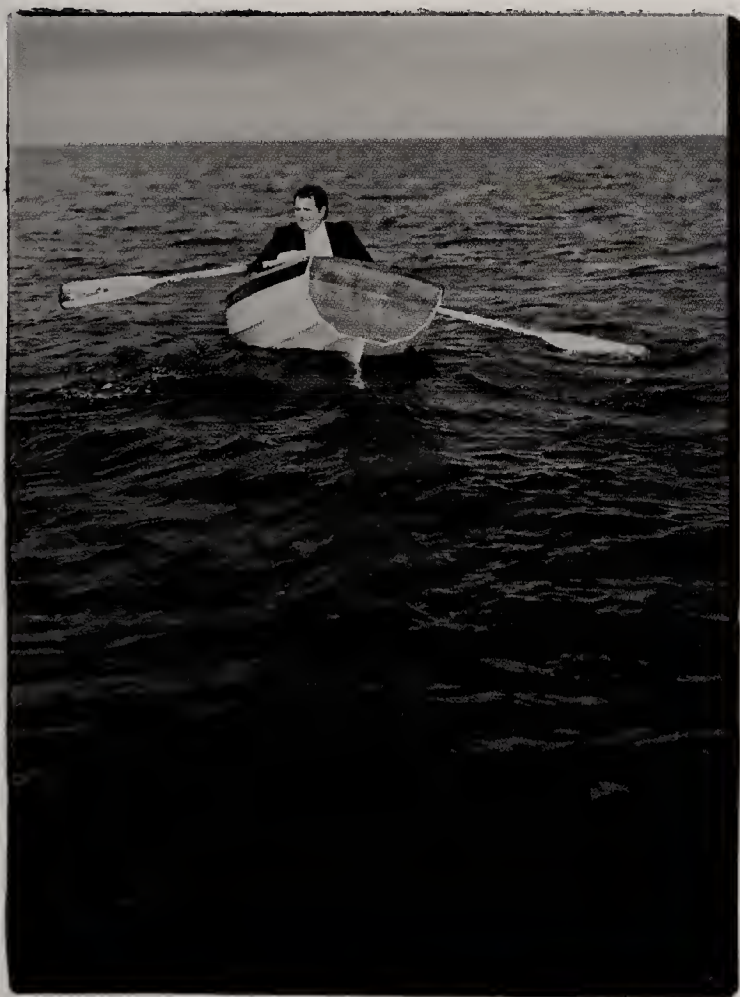


Laboratory for Computer Science and director of the World Wide Web Consortium, could not be reached to confirm or deny this account.

—David Rosenbaum

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Trendlines

Help for the Financially Challenged

I.T. VALUE With the Y2K finish line looming, CEOs are tired of shelling out money for new, compliant systems. So it's become even harder for CIOs to get away with asking for IT investments without first explaining the business value of their projects. After all, "less than one-third of CEOs expect

IT to have a high impact on cost reduction," according to Compass Analysis UK Ltd.'s recent survey of 650 CEOs and other senior executives conducted by the London School of Economics.

The survey, commissioned by the Guildford, England-based consultancy and entitled "The Compass International IT Strategy Census 1999," indicates that CEOs want better metrics to assess IT projects. This is where value analysis comes in. And to help IT executives do the math, there's Value Technology LLC's new Web site, ValueLink, providing a collection of tools and strategies.

For valuing IT infrastructure improvements, for example, the Benefits Jump-Start section of the site's Value Tool Box suggests a sleight of hand that ignores the infrastructure and instead measures the business apps the

infrastructure will enable. For sales-force automation (SFA) projects, ValueLink suggests a formula that divides the salesperson's gross by time. That provides the salesperson's productivity average. Then you subtract the nonsales time the SFA will eliminate and recalculate and, voilà, you get the value.

ValueLink, which went online in April 1999, is still a work in progress. Its creators, however, had the good sense to include a link in its News section to a CIO Section 2 story on IT valuation strategies ("Maximizing IT Investments," July 15, 1999). Funny thing, though. The article was written by John R. Stoiber who, coincidentally, is the CEO and president of Value Technology.

For more information on ValueLink, visit www.valuetech.com/valuelink.

—Kelli Botta



(Continued from Page 20) going on that day—the Clinton impeachment, U.S. planes bombing Iraq—and the radio stations were understandably irate about having their fax machines tied up. The complaints began to pour into NetRageous's offices, and they were notably lacking in goodwill.

"Our phone rang basically nonstop for seven hours," says Audri Lanford.

The problem was compounded and extended because when NetRageous called the fax service to stop the madness, the company's business day had not yet begun and there was no one in the office except a receptionist, who didn't know how to stop the fax. When the staff did arrive, it took NetRageous three hours to convince them there was a problem. "People in technical fields are often hard to convince if you suggest that their systems are at fault," says the Lanfords.

It took most of the day for the service provider to fix the problem. The fax company also wound up paying

damages to some radio stations and compensated NetRageous by providing lots and lots of free faxing and paying for some of the expenses the Lanfords incurred.

NetRageous extracted these lessons for broadcast marketing:

1. If you use a service, make sure the company provides a 24-hour phone number and guarantees that it will be able to stop your transmission in case of an emergency.
2. If your service provider doesn't recognize the problem immediately, provide the unfortunate fax recipients the service provider's phone number. In other words, share your pain.
3. For companies doing their own fax broadcasting, physically pull the plug on the fax distribution machines, fix the problem in offline mode, then test and monitor carefully when you reconnect the systems.

Now sleep tight, kiddies. Don't let the bed bugs bite.

—Derek Slater

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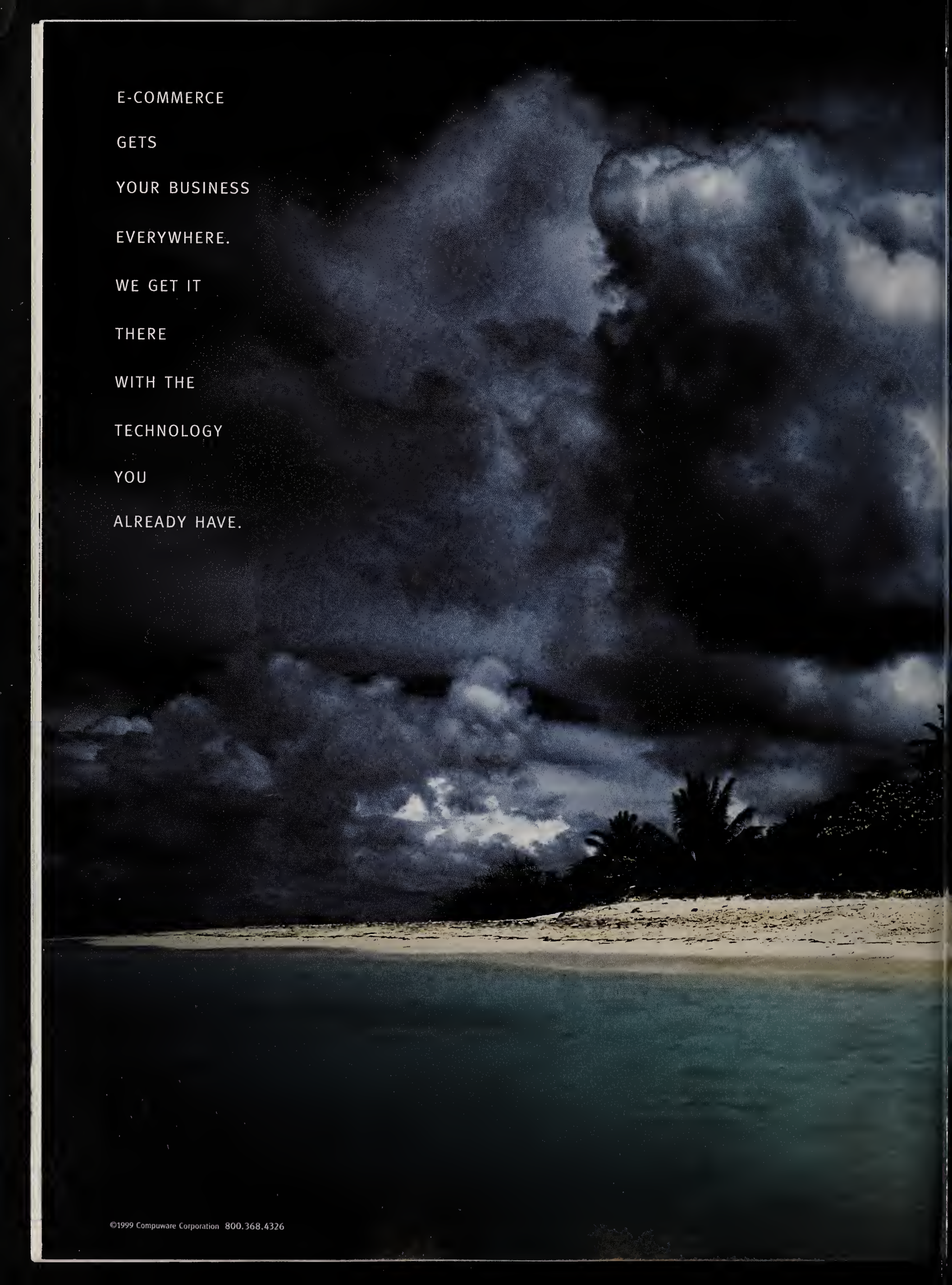
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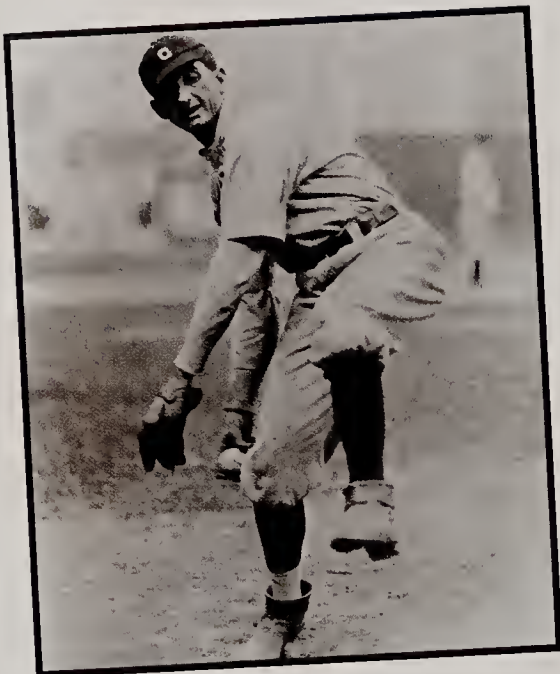


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Trendlines



Time to Pardon Shoeless Joe

ON THE WEB As the last World Series of the century plays out this month, our thoughts turn to the century's most infamous Series: 1919, Cincinnati Reds versus Chicago White Sox, a.k.a. the Black Sox. Those were the games allegedly fixed by Arnold Rothstein and thrown by eight White Sox players, all of whom were afterward banned from baseball. The most famous of the eight was the great Joseph Jefferson "Shoeless Joe" Jackson.

Many Web sites are devoted to the man with the third-highest lifetime batting average in major league history. The best of the lot is the Shoeless Joe Jackson Virtual Hall of Fame (www.blackbetsy.com), which argues for his inclusion in the brick-and-mortar Hall in Cooperstown, N.Y., from which he is barred. The site is full of photos, memorabilia and facts (Black Betsy was the name Jackson gave his favorite bat; he hit .375 in the 1919 Series, slugged the only home run and fielded flawlessly—an odd performance from a man supposedly trying to lose). The site also invites visitors to "Leave a note for Joe."

Jackson's last words were, "I'm going to meet the greatest umpire of all—and he knows I'm innocent." Today, so does most everybody.

—David Rosenbaum

Off the Shelf

Everybody Wants to Rule the World

Race for the World: Strategies to Build a Great Global Firm

By Lowell Bryan, Jane Fraser, Jeremy Oppenheim and Wilhelm Rall
Harvard Business School Press, 1999; \$29.95

THE KEY INGREDIENTS FOR SUCCESS IN THE NEW ECONOMY ARE pretty much the same for a small company as they are for a global giant: Exploit your intangible assets (talent, knowledge, relationships and reputation) better than your competition does. But knowing where to find these assets and how to use them is not so simple. The authors of *Race for the World*, all consultants at McKinsey & Co., sketch out a future in which only those world-class companies that understand these issues will survive.

Some of their thinking goes against current new-economy dogma. The race, for example, may not always be to the swiftest but to the most deliberate. Some winners will be those companies that are able to delay strategic decisions, the better to take advantage of the global flow of information that technology is facilitating.

Another shrewd point: While global economies of scale are desirable, it may be more profitable to focus on markets where customers still have limited choice and most of the competitors are local incumbents with mediocre skills.

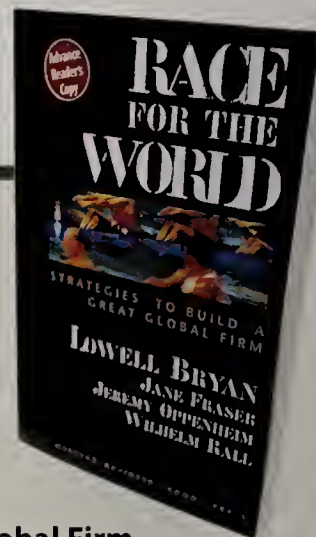
But the grand opportunities for market share won't all be in emerging markets. Companies looking to take advantage of economies of scale should note that currently the most intense market integration is occurring within and between the United States and Europe. Such integration, which brings a reduction of regulation and creates an increasingly homogeneous pool of consumers, makes selling and marketing a whole lot less costly.

With clear and easily digestible arguments and figures, *Race for the World* disabuses readers of the notion that globalization has extended...globally. One-third of the world's industries operate in locally defined markets (such as education, real estate and medical care); one-third in national markets (business services, power suppliers and branded consumer goods, such as beer or shoes). Only the last third (say, telecom equipment, shipping, manufactured commodities and consumer electronics) has, to date, gone global.

However, the book makes bold predictions about globalization's advance. It estimates, for example, that consumers will have access to 80 percent of the world's goods within 30 years, a quadrupling of their current access to a mere 20 percent. Similarly, companies will increasingly have access to the world's best resources: the best labor, technology and low-cost, high-quality suppliers. Of course, so will their competitors. Therefore, even companies that now dominate their national markets will come under intense pressure.

All the basic points here are about the overabundance of choices most companies must face, whether it is choosing markets, partners or technology. *Race for the World* is a strong guidebook for any executive contemplating those choices.

—Gary Abramson



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Trendlines

Where's Waldo?

SECURITY The problem with an encrypted message is that it announces, "Hey! Smart guy! Try to crack me."

However, with steganography a message can be embedded in a digital image so that no one knows it's there. Except, of course, the person for whom the message is



intended. That person can separate the message from the image with software recently developed by University of Maine engineering professor Rick Eason and Kyushu Institute of Technology professor Eiji Kawaguchi.

While Eason and Kawaguchi's software is new, with patent pending, steganography isn't. The word means "covered writing" and derives from the Greek. One ancient method of concealment was to shave the head of the messenger and tattoo the message on his head. After the messenger's hair grew in, the tattoo would be undetected until his head was shaved again. Modern examples are invisible inks

and microdots.

Hiding information among the pixels is not new either. But whereas previous steganographic efforts focused on the least significant areas of an image, which were easy to manipulate without affecting the picture, Eason and Kawaguchi use the most complex, or noisiest, parts of the image where the pixels are densest, thereby making the message that much harder to decode.

Just as Waldo, for example, is usually hidden in the busiest part of the picture.

While the military and industrial espionage value of steganography is obvious, Eason envisions other, more benign apps. "You could have a digital photo album," says Eason, a 43-year-old Tennessean who's been teaching at Maine's frigid Orono campus for 11 years. "You could embed notes in the picture: who's in it, what f-stop you used, the date, a

QUOTE:
"Furby has four times the technology of the Apollo lunar lander."

—Michael Hawley, professor, MIT Media Laboratory, at the CIO-100 Symposium, San Diego, August 1999

personal memory.

"It's also good for ID and smart cards," he continues. "You put a chip on the card; you put a digital image in the chip; you put data in the image—mom's maiden name, fingerprint information, iris photos. Makes it much harder to forge."

And as for finding Waldo? Forget it.

—David Rosenbaum

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(See our special report on ERP, beginning on Page 38.)

SOURCE: META GROUP INC.

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Career Counsel

CIOs and aspiring IT managers seek guidance from Korn/Ferry executive recruiter Mark Polansky

Looking for executive IT career advice? The following are excerpts from our ongoing online column, Executive Career Counselor, in which resident expert Mark Polansky answers your questions about senior-level career advancement, change, education, strategy and more. Polansky is a managing director and member of the advanced technology practice in the New York City office of Korn/Ferry International, one of the world's leading executive search firms. Visit our Web site at www.cio.com/forums/executive/counselor.html to read more questions and answers or for advice on your own career plans. —The Editors

Dear Mark: I have worked for 10 years as an IT director in a small (500-user LAN) nonprofit company. After I took the job, I realized they wanted my technical expertise (CNE, MSCE) more than my administrative skills. I am almost 50, and this seems like a dead-end situation. How do I get back on a reasonable career track that leverages my technical skills and, more important, my administrative experience, people skills and passion for information systems?

Dear IT Director: Regardless of your age, a dead end is never where you should be if you have more strategic and leadership value to offer your employer. First, talk to your managers—in a positive way—about the exciting things that IT can do for the organization, like saving money through operating efficiency, raising more contributions through an intelligent fund-raising database system and so on. If they don't get it, then perhaps it's time to move on to a more progressive and enlightened environment.

Dear Mark: I am contemplating going back to school to get a mas-

ter's degree. My career goals include making it to the ranks of CIO at a major organization. What would be the best master's degree to pursue to continue on my upward path?

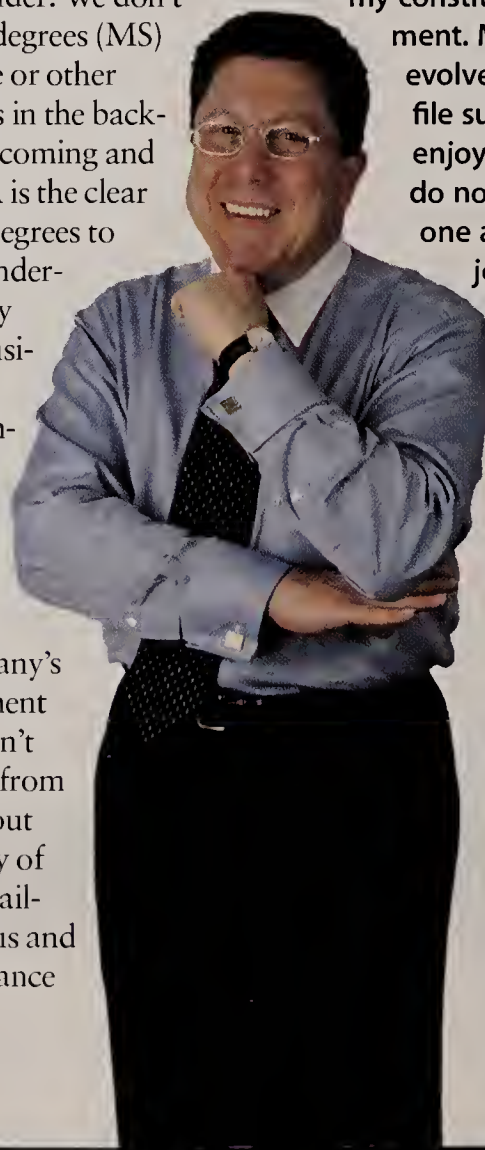
Dear Upward Bounder: We don't look for advanced degrees (MS) in computer science or other technical disciplines in the backgrounds of up-and-coming and top CIOs. An MBA is the clear choice of master's degrees to prepare a CIO to understand and effectively align IT with the business plans and the operations of an employer. An MBA should enable you to not only hold your own but to intelligently contribute at the company's executive management table. And if you can't take the time away from your career, check out the wide availability of executive MBAs available both on campus and online through distance

education. As to your area of concentration, once again information systems would tend to brand you as insular rather than business focused. If you have a chosen industry orientation then select an appropriate field, for example, finance for investment banking or marketing for consumer products. A management concentration is neutral and always helpful. Whatever your choice, make sure to include enough finance content so that you really understand profit-and-loss statements and balance sheets—your CEO and CFO will really appreciate that.

Dear Mark: During the past 10 years, I have served as CFO, then COO of a group of related subsidiaries of public energy utilities. However, my background, dating to the mid-'70s, was in systems development and implementation for large financial information services companies (multibillion-dollar public companies). Even today, I'm drawn back into IT issues because

my constituents trust my judgment. My past work has evolved into some high-profile successes, and frankly, I enjoy that more than what I do now. Unfortunately, the one attribute of my current job that surpasses all others in satisfaction is seeing the winds of political change and my resulting ability to anticipate the appropriate company positioning.

My question is this: Are there career opportunities that combine a love of technical strategy with true senior management equivalency? If so, is it best to approach these with a develop-



CORNER IMAGE BY CARL TREMBLAY; PHOTO BY ANDRE SOUROUJON

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mental/project-oriented presentation or with a senior management accomplishment background?

Dear COO: Consider looking for a senior management position in the IT industry. IT product and services companies—both large and small, startup and mature alike—are hungry for executives who understand their technology and customer value and who can provide the vision and leadership to help grow their businesses.

Dear Mark: How does one move from a director-level position into a CIO position? What are the major skills required?

Dear Director: Making the break from director to CIO is based on your making the change from a more tactical and less strategic role to the reverse, of a mostly strategic and business-driven role with far less tactical focus. This is the single most important attribute of a true chief

information officer. The key skills are vision, leadership, solid technical grounding, strong business acumen, creative thinking and problem solving, excellent communication and relationship building, and a can-do attitude.

Dear Mark: I have over 31 years of experience as a systems engineer, consultant, entrepreneur and CIO. I have analyzed, developed and implemented systems in all business areas such as manufacturing, materials, accounts, costing, budgeting, marketing, MRP and so on. I have been a key person in reengineering and change-management projects involving ERP systems such as SAP and Oracle Financials. I have custom developed large client/server IT solutions and have set up a large, high-process maturity software development factory. I am heavily into process improvement, quality management and TQM, and have strong skills in project management, reengineering

and organization change management. I am working in a consulting company and am looking for a change. Could you suggest a suitable approach?

Dear Jack-of-All-Trades: Sure—send me your resume before you send it to anyone else! If what you say is true, it is clear that you have many skills and experiences that would make you a highly attractive senior management candidate in the corporate IT arena. The transition from consulting to corporate IT leadership will hinge on your ability to align your IT organization with the mission and the business plan of a prospective employer company—in contrast to the more common project-oriented focus of a great many consultants.

Dear Mark: I have worked directly for CIOs and directors for the last 10 years. I have the skills (so I have been told by my peers and bosses) to be a CIO or director, but how do I break the

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barrier? I am told I cannot be hired or promoted to a higher position until I have some actual experience in the position. Is this the old Catch-22?

Dear Barrier Breaker: Nonsense. If you are truly qualified to be a chief information officer, some company out there will welcome your skills and experience. But don't let flattering remarks turn your head—get some independent assessment of your readiness. And if you are CIO material, then strike out after your goal. Good luck!

Dear Mark: I'm currently the IT director for a small U.K.-based, international biotechnology company. It's a position I have held for almost three years. For the previous two years, I was regional IT manager for one of the world's top engineering consultancies in charge of all aspects of IT for its third-largest global region.

I'm now considering the options that

lie ahead. There seems to be a lot of exciting opportunities in the United States. As a U.K. national, I'm wondering if there is a realistic chance that a U.S. company might select me, sponsor the appropriate visas and relocate me to the United States?

Dear Brit: Yes, I think there is a chance that you could find a suitable position on this side of the pond, but it won't be easy. First, you must use all of your selling points as a candidate. That means trading on your industry experience in biotechnology and engineering consulting, your international experience, which should be attractive to a global company, plus any other specifics you've been involved in, like a hot technology, an ERP implementation or an e-commerce initiative. Then do some research and send a cover letter and resume to as many U.S. companies that match your personal-market value proposition as possible.

Second, because you are coming from

a small foreign company, look not only for a number-one job at a small U.S. company but also give very strong consideration to the number two, three or four jobs at bigger organizations, or more likely a project-management spot in one of the major American biotech companies with the idea of getting inside and showing them what you can do. Besides, there are a lot more of those positions available. Also, send your letter and resume to the recruiting communities in your industry experience groups as well as in IT. Lastly, if you can afford to, take a few weeks off and come to the United States. Use your cover letters to let everyone know when you will be here and set up as many appointments ahead of time as you can, then follow up by phone with your prime targets once you arrive here. **CIO**

The Web-based Executive Career Counselor column is edited by Web Research Editor Kathleen Kotwica. She can be reached at kkotwica@cio.com.



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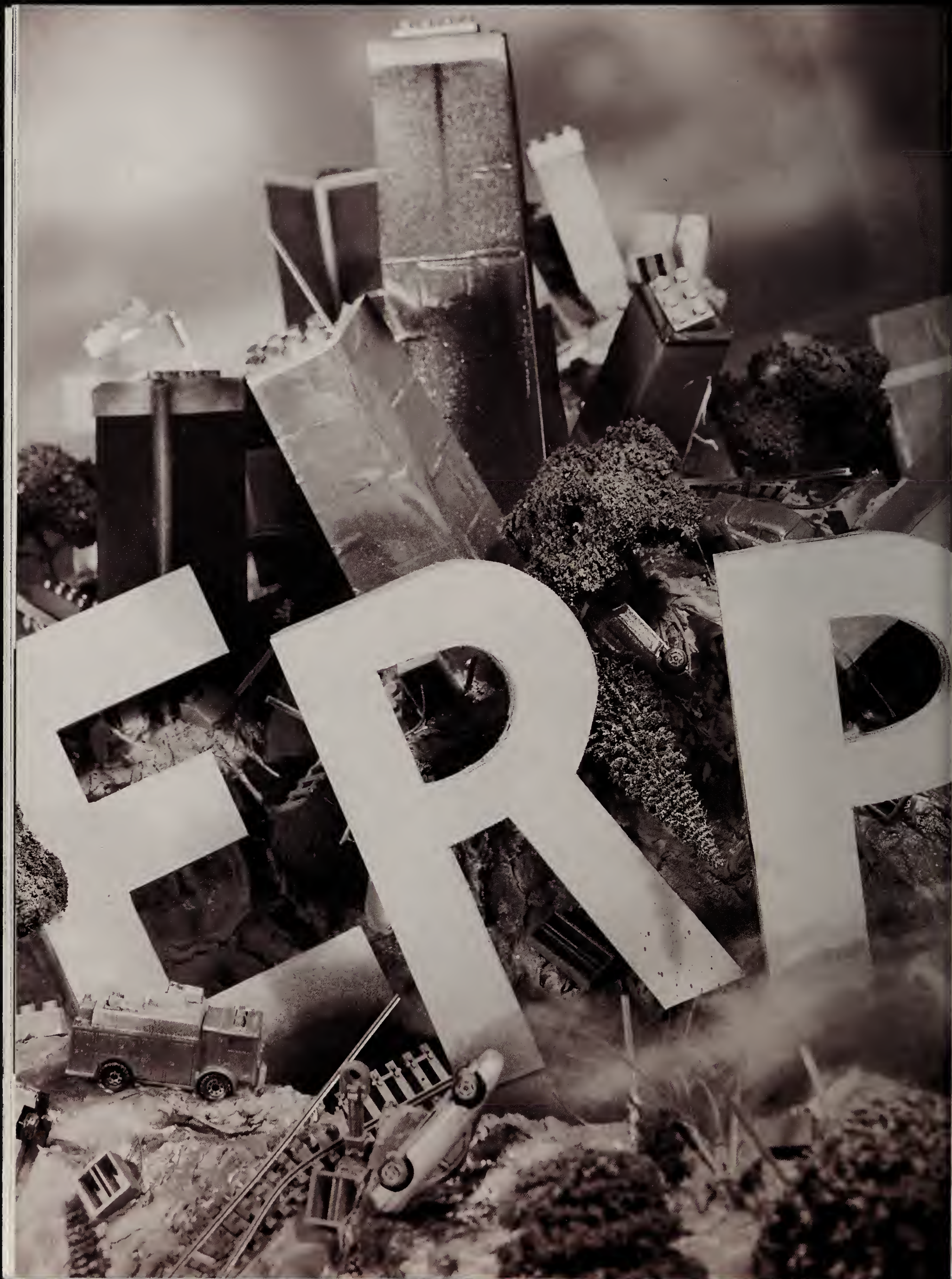
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Left to right: Compaq AlphaServer, Compaq ProLiant, Compaq NonStop Himalaya



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ERP— QUAKE!

When it comes to ERP projects, Fortune 500 companies are beginning to sound like kids in the back seat of the car on a long drive. Are we there yet? Are we done yet?

No! We're not there and we're not done. And we may never be done, so pipe down, OK?!

Enterprise resource planning (ERP) projects do not end. Not only does implementation take forever (many companies already have been at it for years), but once the software is installed, the enterprise will be operating in a totally new way. Everyone's job is going to change—radically.

Order entry clerks who type will become business people who make decisions that affect the company's bottom line.

Finance managers will have to know what warehouse managers are doing. At all times. In real-time.

IS engineers will become business process leaders and owners.

ERP team members, chosen from every part of the company, will never be able to go back to their old jobs.

Of course, it will be hard to keep exhausted, under-rewarded ERP veterans—who now know more about the business than anyone else—from bolting as soon as the software is up and running. And they'll need more than money to stick around. They'll need the power to do with the business what they just did with the software: change everything. It's up to CIOs to find permanent places for these people if there's going to be any hope of delivering the value from ERP that was promised those many years ago when the project was approved.

If the ERP project ever really ends, if the project team is broken up and sent home, so ends the potential for the company's growth, for change, for adding more value down the road. CIOs who think of ERP projects in terms of just getting the stuff on users' desktops don't have much of a future.

ERP changes everything, and CIOs need to learn an entirely new set of rules.

Now is a good time to start.

—Christopher Koch

In This Section

- Project Management
"The Most Important Team in History"
- Enterprise Leadership
"From Team Techie to Enterprise Leader"
- E-Commerce "Can You Do the WWW?"



Dianne King, Sebastian's director of IT (far left), and Pat McKay, ERP team member (second from left), are ERP veterans who now know more about how to run the business than almost anyone else.

The Most Important TEAM in History

After a company turns on its enterprise resource planning software, the only people who understand how the business works are on the ERP implementation team

BY CHRISTOPHER KOCH

Enterprise resource planning software, a.k.a. ERP, has a transformational effect—not only on the businesses that install it but also on the people who do the installing.

“My life changed during the project—I began speaking in ERP,” recalls Pat McKay, who spent four years working in (and eventually managing) an order entry and customer service department before joining the ERP project team at Sebastian International Inc., a Woodland Hills, Calif.-based hair-care, skin-care and cosmetic products company. Though she had never before worked on a software project, McKay learned the ins and outs of SAP AG’s R/3 package over the course of the six-month-long installation. Now she works full time as an in-house consultant.

But McKay didn’t just learn about R/3. She also learned the business. And she’s not shy about saying so.

“We basically run the company,” she says of herself and her fellow Sebastian ERP project veterans. “We make the decisions. Two years ago, it would have been unheard of for [people in our positions] to make those decisions, but now people want us to help run their departments.”

Reader ROI

IN THIS STORY, YOU WILL LEARN

- How to plan for post-ERP dislocations
- How to manage your implementation team after the system goes live
- How to turn IS into a business process team

Decisions like when to offer discounts and rebates (which she has to program into the system) or whom to extend credit to and whom to cut off. And it’s the same story for most ERP veterans. The companies that listened to the first wave of advice when ERP took off in the United States in the mid-1990s knew that their ERP project teams should be picked from the best and brightest in each of the different functional areas of the company. Now that many ERP projects have



Katherine Jacobs (center), Compass Group North America's vice president of IS, has stopped trying to put ERP project veterans back in their old jobs.

finally reached the point where the software is up and running, companies have watched these people become the most knowledgeable in every area of the business. They know more about the sales process than the salespeople do and more about the manufacturing process than the manufacturing people do. They constitute the most valuable software project teams in history. Too bad most companies don't realize it.

The ERP Experience

Most companies are still treating their ERP implementations as they would any other software project, albeit a bigger and more expensive one. Once the software is installed, the team is scuttled and everybody goes back to his or her day job.

But ERP isn't like any other software project. It doesn't merely change employees' computer screens the way previous generations of software did; it changes the way they do their jobs. ERP project teams are not just installing software; they are reinventing how the company does business. For example, pre-ERP, warehouse clerks knew they could let a truck leave the loading dock without checking off the goods shipped on the packing slip; the slip would be there, and if the clerks forgot about it, at some point, accounts receivable would call them up and yell. Not anymore. If the clerks don't account for everything when the truck leaves, the customer will never get an invoice, because the ERP system has no record of goods being shipped. Accounts receivable won't ever

know that the customer received the goods and won't be able to act as sweeper-upper anymore—no more wake-up calls to the loading dock. And whose responsibility is it to get those warehouse clerks up to speed, to make sure they and everybody else who will be using the ERP system understands their new, expanded responsibilities? The ERP project team.

Yet most companies don't know what to do with their project veterans once the new software flickers onto their employees' screens. Most send them shuffling back to their old jobs, which, when viewed from the exciting, passionate heights of the ERP project, feels like being sentenced to a lifetime of drudgery. "It just wasn't working," says McKay of her return to her old job. "My knowledge had grown so much. I felt I was being wasted."

The ERP experience makes it hard for the people who go through it to adjust to the rather less intense real life of the business. If these people don't get something challenging and interesting to do when the project ends, they start posting their resumes.

At Compass Group North America, a food service company in Charlotte, N.C., that also installed SAP's R/3, project veterans were in great demand from their old

units, but Katherine Jacobs, the company's vice president of IS, stopped sending them back. "They have really grown beyond where they were, and it's difficult to put them back in their old jobs," she says. "The first two times we tried, it went poorly, so I'm keeping the rest of them until I get it figured out."

This is one team that you cannot afford to lose. If you do, your business will surely suffer.

The Post-ERP Slump

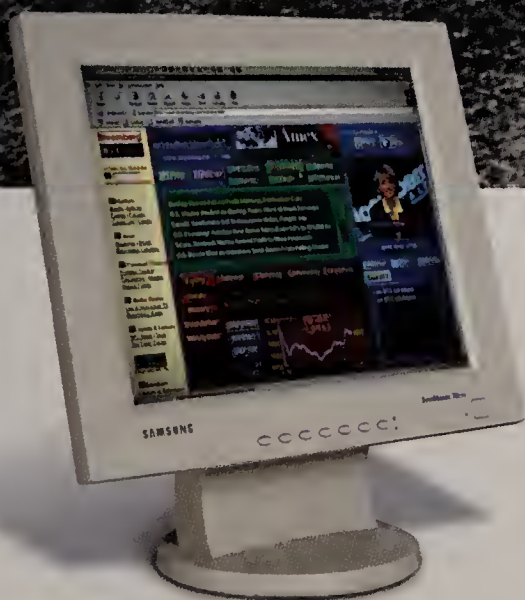
ERP systems inevitably cause havoc in the companies that install them. In a recent survey of 64 Fortune 500 companies that was commissioned by Deloitte Consulting LLC, one in four said they suffered a drop in performance when their ERP systems went live. In reality, that percentage is undoubtedly much higher. Oddly enough, the survey was not asking about a post-ERP business performance dip; it was far more general. The companies that said their businesses had suffered had volunteered the information, says Susan Irving, a director at Benchmarking Partners Inc., the Cambridge, Mass.-based consultancy that performed the survey.

"Most companies should expect to see some dip in their business performance at the time they go live and should expect that they'll need to manage through that dip [for three to nine months]," she says. "There should be a plan before they go live to mitigate that."

The most common reason for the performance problems is that everything looks and works differently from

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the way it did before. When people can't do their jobs in the familiar way and haven't yet mastered the new way, they panic, and the business goes into spasms.

McKay saw it coming at Sebastian. She knew the new software was more complicated to use than the old system and that her seven order entry reps and eight customer service people were going to have to struggle to handle Sebastian's 800 daily customer calls. The double whammy came when the system went live in January 1998 and various components failed. For example, reps couldn't process credit card orders through the system, which disrupted customer shipments. "Customers didn't get deliveries, or they got the wrong amount or the wrong products, you name it," says McKay. The customer service people had so many questions about the new system that the project team spent much of the first few weeks by their side, putting out fires left and right.

"It was overwhelming," says Dianne King, who worked with McKay and became Sebastian's director of IT after the software went live. Mistakes rippled through the system and brought the order and delivery processes to a virtual standstill. Down in the warehouse, Sebastian's managers began processing delivery lists by hand just to get products out. "It was just a big clog," says King, adding that it wasn't until five months later, in May, that Sebastian smoothed over the problems with its customers. The system itself wouldn't calm down until September.

During that hectic time, King's harried project team of 16 dwindled to eight. "We had headhunters hounding us every week, offering us the world, doubling and tripling our salaries and offering consulting positions elsewhere," says King. At the same time, the team was, as King says, taking "a lot of heat from customers and from internal people saying a lot of not-so-nice things. The reward wasn't really there at the end." So the headhunters found a receptive audience.

McKay certainly thought about leaving when she had to go back to the phones in customer service. "At the beginning of the project, I thought I would be able to go back to my

ERP Is Expensive...

Average total cost of ownership for an ERP implementation:

\$15 million

Per frequent user:

\$53,320

(Includes hardware, software, professional services and internal staff costs for full implementation plus two years post-implementation costs)

SOURCE: META GROUP

group at the end and reengineer everything," she says. Instead, she became the unofficial help desk even while she worked at her old job. "It wasn't that it was too difficult doing both things; I just felt that there was so much left to be done and I had no time to do it," she recalls. She approached Sebastian's HR department in April to ask about what could be done. King suggested she become a full-time SAP consultant. To King's relief, HR agreed.

"The [team members] who stayed are driving the company now because they have the functional knowledge and the system knowledge," says King.

Still, Sebastian's ERP team members' value to the company wasn't as apparent to top management as it should have been. Even though McKay got to work on SAP full time, she wasn't able to do it in her old department. She had to move to IS, as have many business veterans of ERP projects, simply because their companies didn't know what else to do with them once the project officially ended. Compass Group's Jacobs faces the same dilemma. "I don't want to keep them in my department too long because otherwise peo-



FDX Corp. CTO Rob Carter (seated) had to tell department leaders they would lose their best people to ERP—forever.

PHOTO BY STEVE JONES



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ple in the company will begin to see them as IS people rather than business people," she says.

Why ERP Is Forever

ERP makes Yogi Berra look like a pessimist. Yogi said, "It ain't over 'til it's over." Well, with ERP, it just ain't over—period. ERP veterans can't afford to lose their links to the business because there's so much to do after the ERP software is installed.

"There are timing and scope issues during the project that cause you to say, 'We'll do this piece later.' Well, it's 'later' now," says Griff Ladner, senior manager of corporate accounting systems for Memphis-based Federal Express Corp.

Ladner realized that with 180 business units to work on worldwide, his team's PeopleSoft Inc. ERP implementation wasn't just going to end.

Even before the project began, he told his ERP team candidates, and the business departments they came from, that no one would be going back to his or her old job—ever.

"I saw the implementation as the beginning of a long road," says Ladner. "You plug the system in, and then there are a lot of things that have to be done to improve it and grow it. [The team members] felt they had an opportunity after the implementation phase to help mature and improve the system, and that intrigued them. They saw

that they had a future with the team. It wasn't just going to be an implementation and [then] a breakup of the group."

Ladner chose the team early in the project, even before the ERP software was selected, and arranged for team members to finish their current projects and help train replacements before they began full-time work on the implementation. Not surprisingly, the different business areas weren't crazy about saying goodbye to some of their best people forever.

"We had a lot of tough meetings trying to convince people in the different businesses that this was the right thing to do for the corporation," says FDX Corp. (FedEx's parent company since January 1998) Corporate Vice President and CTO Rob Carter. "It's not easy to get people to give up their superstars so that they can go implement someone else's system." Ladner says it took up to six months to pull people completely away from their business duties. Now he can't imagine breaking up the team.

Today, besides offering continuing support for the people using the system, Ladner and his team are trying to figure out new ways of pulling information out of it.

That's one of the most urgent duties teams face after the initial ERP installation. Before ERP, companies spent years developing internal reports that plucked raw numbers out of the old computer systems and grouped them together for analysis. Employees want to do the same thing with their new ERP systems. It's a difficult job because while ERP software comes with some standard report templates, few offer the kind of customized specificity and idiosyncrasy that most large companies need. It's up to the project teams to define and create those reports with lots of input from the company at large.

Most ERP project teams put this off until after implementation because it promises the same kind of intensity and need for business and technology knowledge as the project itself did. "Reporting systems at FedEx developed over a 20-year period," says Ladner. "I don't think you can go in and do a rapid implementation while also addressing 20 years of development at the same time."

Ladner's team built a software bridge

The Payback Takes Awhile...

Average time before ERP system shows benefits:

31 months

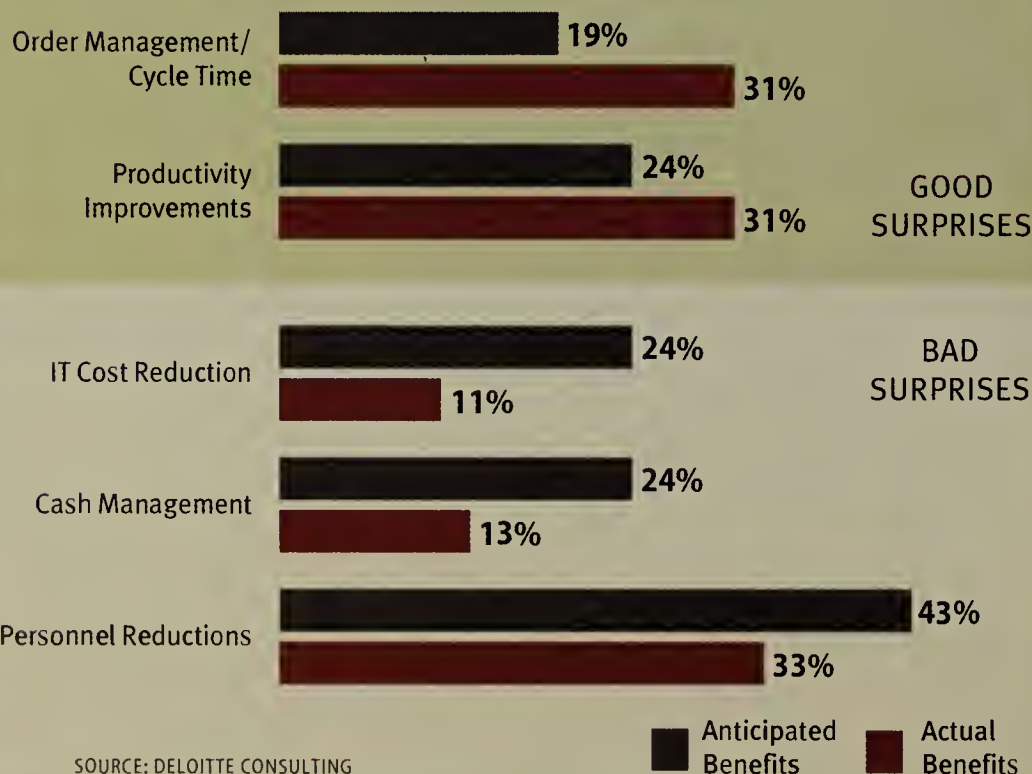
Average benefit per year:

\$5 million

SOURCE: META GROUP

This Is What You Want, This Is What You Get

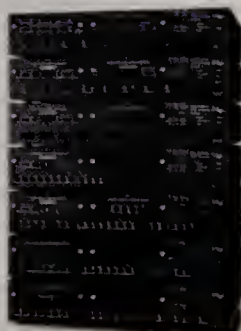
Percent of respondents who expected benefits versus those who actually received them



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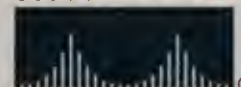
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from the new ERP system to the legacy financial systems so that the old reporting systems could continue to operate. "Now our job is to go in and replace all the legacy tools that were developed," he says. "It's not going to take me 20 years, but it won't take three months, either."

Those reports are taking a heavy toll on ERP systems everywhere because for the first time hundreds, even thousands of employees around the world are going to ERP's single, integrated database and pulling huge piles of data over the company's computer network to populate these new reports. All those reports clog up networks that are shared by employees trying to enter transactions into the system. This is the number-one technology fire that ERP project teams have to put out after the new system goes in.

Take Hasbro Inc.'s European SAP installation (there are separate ones for the United States and the Far East). The software supports eight different countries from its central database in England, each with its unique way of doing business. To reflect those local practices, the global toy company has built each set of local practices into the new system, adding layers of computer code to each country's transactions. It all adds up to slow response time and a big challenge for the project team.

"There isn't a machine out there that can handle this ERP system," says Philip Oates, project manager in the SAP practice of the British arm of Origin BV, an IT services company based in Eindhoven, Netherlands, about the computing power demands of Hasbro. Though it would be nice to have faster hardware, that's not the main issue in resolving the problems, says Oates. The trick is to reduce the load on the system at its source—the many different business processes used around the world.

Around the World in 80 Iterations

Hasbro and other global companies are trying to reduce the performance issue by making the software travel well—literally. In 1998 Hasbro took its U.S. ERP system (SAP), made a copy of it and sent it to Europe for the European installation. "We call it the 70-20-10 rule," says Michael Elliott, head of IS for Hasbro Europe: Make 70 percent of the European installation the same as the U.S. system, make 20 percent common across all eight European countries involved and 10 percent specific to each country. "There seemed little point to have the U.S. configuration and not use that when we went into Europe," says Elliott. To help those synergies along, Hasbro has a European ERP team, based in London, to supervise the rollout in the local countries.

Monsanto Co., which has been installing SAP in its various divisions since 1994, has applied the commonality concept to the way it installs the software. Monsanto sup-

ports a core team of 150 ERP vets that sends emissaries out to the different areas of the company where ERP is being implemented. They provide local ERP teams with support and guidance. The team provides a business process expert and a technology expert (occasionally one and the same person) for each SAP process to be installed at the site, but they don't do the actual implementation. Instead, they provide templates showing how to do the installation, templates that are customized to reflect the common business practices across Monsanto, while allowing for individual differences according to locale. The team helps the local group determine how many people will be needed to install and maintain the system, and trains them in the Monsanto ERP way.

And When ERP Goes Live, Your Business Will Suffer.

Most companies implementing ERP should expect a drop in business performance lasting between three months and nine months after going live.

SOURCE: BENCHMARKING PARTNERS

Who Needs IS?

Not every company wants to expend the effort and resources necessary to perfect its installation methods. When his SAP project began, Dave Ellard, vice president of global systems at Boston Scientific Corp., outsourced the programming and post-implementation care, and feeding of the system to Andersen Consulting, which was also Ellard's implementation partner. The idea was to get rid of anything that would distract his project team from the purity of its mission to improve business practices and help others in the company use the system after going live. If modifications are needed, the team members manage the 42 Andersen people assigned to Boston Scientific, a Natick, Mass.-based maker of noninvasive surgical instruments, to deliver the new code.

Yet even clearing the decks in this way still leaves Ellard's team stretched trying to cover Boston Scientific's 5,000 SAP users around the world.

"My biggest issue right now is we have a tremendous surge of things we could be doing," says Ellard. "The different divisions can't get everything they want because we're managing the system centrally. We're working to develop our process of global communication for dealing with issues in the system." Ellard says he wants to build up his staff of 17 ERP project veterans to respond to these issues—a common wish among CIOs once the system is up and running.

ERP Post-Y2K

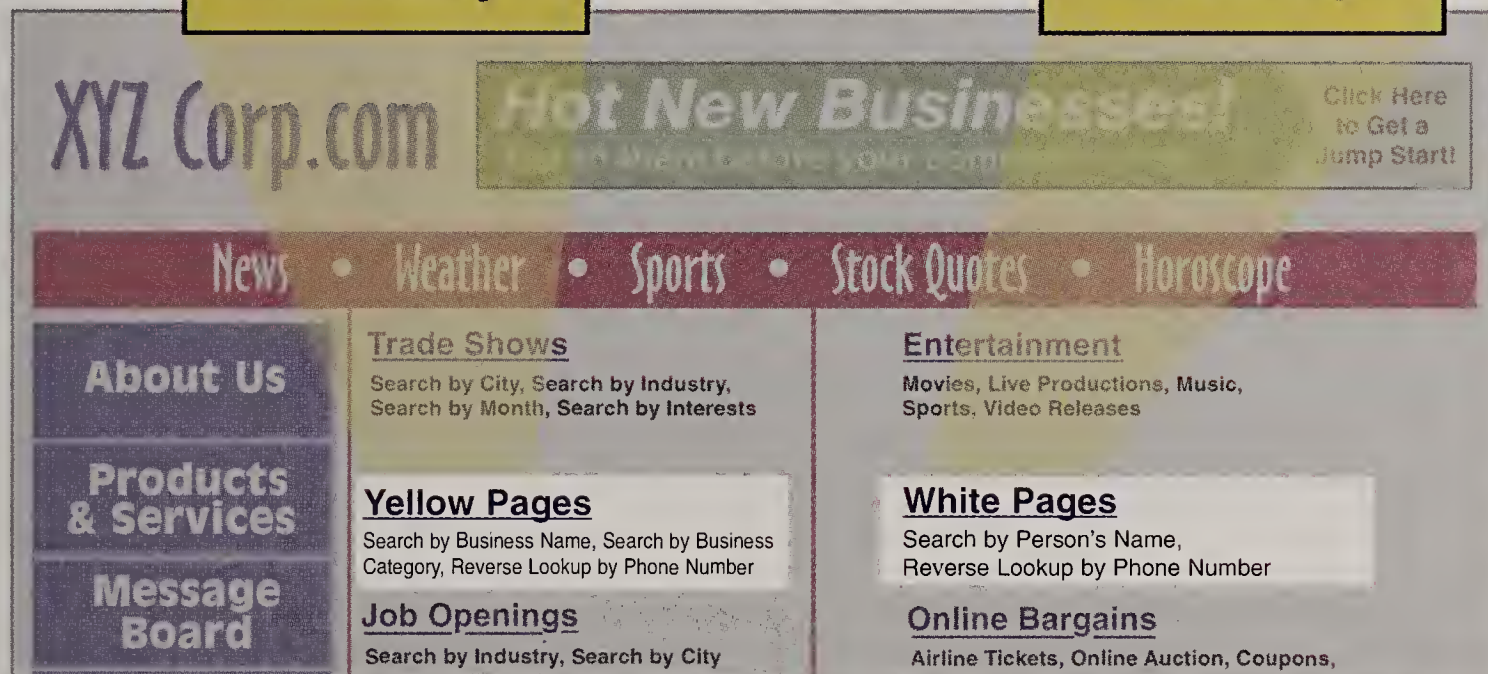
Unfortunately, few IS departments plan for the frenzy of post-ERP installation activity, and fewer still build it into their budgets when they start their ERP projects. Many are forced to beg for more money and staff immediately after the go-live date, when the ERP project may not be

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Your Post-Implementation Checklist

ERP projects succeed best when you know what you're going to do after you get the software up and running. Ask yourself these questions concerning your post-implementation plans to see if you and your team is prepared. If you answer no to any of them, take steps to turn that no into a yes as soon as possible.

■ THE BASICS

You have a post-implementation plan. **Y** or **N**

■ BENEFIT TARGETS

You have made ERP business benefits and capabilities part of the business plans of specific general managers. **Y** or **N**

The projected business benefits of the ERP software have been communicated to the rest of the organization. **Y** or **N**

■ PROJECT TEAMS

Your project team is still in place. **Y** or **N**

The organization has developed a retention plan for "hot skills" employees. **Y** or **N**

Project team members are aware of internal career opportunities available to them. **Y** or **N**

■ BUSINESS METRICS

Business metrics are in place to measure the project's intended benefits versus what has actually been achieved. **Y** or **N**

An owner has been assigned to track each metric. **Y** or **N**

■ PROJECT MANAGEMENT

Programs have been put in place to help individuals cope with major role changes and the stress that comes with it. **Y** or **N**

A center of expertise/ERP support organization has been established to handle user questions, maintenance issues and upgrades. **Y** or **N**

■ PROCESS EXPERTISE

Management is more process-oriented than it was before the ERP effort. **Y** or **N**

There is a reward program for employees who use the system. **Y** or **N**

Requests for new reports are reviewed and approved by a process owner (to avoid clogging the system). **Y** or **N**

■ ERP FOUNDATION

There are plans to extend the ERP system's functionality. **Y** or **N**

■ TRAINING

The training of your users is job-based (beyond simply learning how to use the software). **Y** or **N**

SOURCE: DELOITTE CONSULTING

(and usually is not) demonstrating any business benefits, to say the least.

This may be the most damaging legacy of traditional software project management. The company expects to gain value from the application as soon as it is installed; the team expects a break and maybe a pat on the back. Both expectations are dangerously wrong in an ERP project. Most don't show real value until after companies have had them running for some time and can concentrate on making improvements in the business processes that are affected by the system. And the project team is not going to be rewarded for simply bringing the new application to someone's computer; companies won't be in a giving vein until they see improvements in their employees' ability to do their jobs.

The biggest issue facing ERP project teams in the future may well be keeping the resources and the money and the people flowing to meet the post-implementation demand. For Compass Group's Jacobs, the passing of the Y2K crisis, which prompted much of the ERP craze in the first place, means her expensive SAP project will be left to compete for budget dollars on its own. She fears that the will to support ERP in the business might wane and her project team members will be sent back to their old jobs.

Like many project leaders, her goal is to extend the new system into knowledge management, e-commerce, and more intranet and Internet applications. But she says that executives at Compass Group are tired of IS taking the best people in the company while demanding more funding. The food service industry is a low-margin business that traditionally hasn't had a big focus on technology. Jacobs is hoping to change that, but she knows it won't be easy.

"The ERP project made some converts in key areas of the business who are now advocates of the system," she says. "I just hope technology gets to be more of a business discussion than it has been in the past."

And, of course, she hopes to keep her team intact. **CIO**

Senior Editor Christopher Koch can be reached at ckoch@cio.com.



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Industry: Manufacturing

Company: Robinson Brick

Partner: J.D. Edwards®

Tools: Netfinity®, Lotus® Domino™

Solution: Web Storefront

- 1** Distributors can check production schedules, brick availability and order status online at any time.
- 2** Online sales order system is connected directly to supply chain management, creating a more efficient order-to-shipment process.
- 3** Robinson plans to conduct 50% of its business online by 2001.
- 4** Color samples of the nearly 100 brick types are displayed online, greatly reducing brick selection time.
- 5** Robinson projects cutting its operating brick inventory by as much as 50% by 2001, saving considerably on storage costs.

Manufacturers across most industries are recognizing the efficiencies they can create by moving their business processes onto the Internet. They can streamline ordering and replace most paperwork with digital files. Even smaller manufacturers, such as those in the brick industry, are incorporating e-business to their competitive advantage.

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"We're hoping to conduct over half our business via the Internet by 2001," says Craig DeVere, Robinson Brick's vice president of sales and marketing. "Our Web-enabled system is making every part of the business more profitable." To find out more, call 1 800 IBM 7080, ext. BP05, or download a complimentary consultant report* at www.ibm.com/e-business/jdedwards

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From Team **TECHIE** to ENTERPRISE Leader

After leading an ERP team, David Johns discovered that he had learned everything about the company's business. And management knew it too.

BY CHRISTOPHER KOCH

avid Johns is living proof that an ERP project manager can make every mistake possible during an ERP implementation and still wind up becoming CIO.

Johns was late delivering the software. He didn't train people well enough to be able to use the software once it was delivered. And he didn't adequately test the software before it went live. After it was up and running, you could measure application response times in minutes instead of seconds.

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It was for Johns because, as the 40-year-old executive says, "We made each mistake only once. Each deployment got better."

Since September 1995, Owens Corning Vice President and CIO Johns, one of the pioneer ERP project managers, has been in charge of one of the most ambitious (\$100 million spent so far; \$130 million projected total) global ERP implementations in the world. The project had its roots as a massive reengineering effort at Toledo, Ohio-based Owens Corning in 1992. It turned into something else during the ERP craze of the mid-1990s, and it turned Johns into something else too: a leader.

Reader ROI

IN THIS STORY, YOU WILL LEARN

- ▶ Why ERP projects always become business process reengineering projects
- ▶ How leadership can be forged in the heat of a disaster



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The Mad Attack

In an era characterized by vaguely hopeful Y2K-based project christenings, the \$5 billion building materials giant had an unusually cogent business-based plan of attack for its ERP project. The company, which most



people still associate with the pink hue of its fiberglass insulation, wanted to branch out into windows, siding and roofing, and develop a worldwide presence. ERP, the company figured, would be one of the crucial tools for transforming Owens Corning's 10 different product divisions, each with its own product strategy, customer service department and computer system, into a single integrated entity, using common systems and common business practices. In fact, company leaders dreamed of running their entire global enterprise—every single division in every single location—off a single SAP database in Toledo. The goal was to give every employee in the world access to all of the company's data at the same time.

Owens Corning would become a truly global, real-time company.

When couched in project management terms, however, that dream was more like a mad hallucination. Accessing a single database from anywhere in the world is not easy, and very few companies have attempted it. Besides the potential bandwidth and communications nightmares, nobody wanted

to try to reconcile the myriad local exceptions that arose in the course of doing business. Little things like currency differences, regulatory issues, language and culture.

The Good Soldier

But Johns had been a project manager nearly his entire professional life. When he joined Owens Corning in 1994, he played the good soldier. He took on whatever the company sent his way.

Johns has been fascinated by problem solving—the essence of project management, he says—ever since his days trying to extricate himself from half-nelsons as a varsity wrestler at Ohio State. After graduation in 1982, that determination served him well during his 13 years as a project manager in various Fortune 500 companies.

But Johns had never faced anything on such a sweeping, terrifying scale as he did in March 1997, when his

team hit the switch on the first major SAP installation (Johns' team also installed PeopleSoft's ERP software) for the company's roofing products on the same weekend that Owens Corning's 16 different customer service centers were folded into one. The reorganization, combined with the new ERP system, was simply too much change for the company to handle.

"That first week we went live with roofing, we knew we had some major problems and weren't prepared to handle them," Johns recalls. "There were so many issues—the system wasn't performing right, the response time was poor, the functionality wasn't working the way it was supposed to. The first week we just focused on the technical issues."

But at the end of the first week, when the technical problems began to calm down, Johns lifted his head and saw something he'd never seen before.

"After we fixed some of the technical problems, we started peeling back the onion and saw that this was much bigger than a technology problem. We saw that there were problems in the business, problems with the way people's new roles had been defined, communication and change management issues, and business process issues. That's when we realized it was going to take us a long time to get back to where we needed to be."

Birth of a Leader

The problems Johns and his team were facing weren't just internal. Owens Corning's customers, long accustomed to excellent service and deliveries, weren't getting either. It was such a dramatic, unexpected shift that customers were shocked, and long-term relationships were severed. Johns and the company would spend the rest of that year rebuilding the system, the business processes and trying to repair its relationships with those angry customers.

"That was the most difficult period for us as a project team and for Owens Corning as a business," Johns says.

"I don't want to experience those feelings again"—feelings of guilt at letting down the team and the company, and feelings of frustration at seeing problems leap beyond his immediate reach. Johns couldn't assume personal responsibility for everything anymore; he needed his business partners to come on board if he was going to solve any of the bigger problems that came with the new system.

"That was a real mind-set change for me," he says. "I saw that the system wasn't just impacting the transaction

going through it; it was impacting the entire business process. It used to be that if there were problems with the system, we'd check it to see if it was running properly, and if it was, we'd throw it back to the business

Johns couldn't assume personal responsibility for everything; he needed his business partners.

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and say, 'Look, the system is fine; this is your problem.' We can't afford to do that anymore. Now we own the entire business problem. It may be process, it may be training, it may be technology—we don't care—we'll work with it until the business problem is solved."

Unless, of course, the business doesn't want to help. "That's a big change too," Johns adds. "At the beginning of this project I would say, 'OK, if the business people don't want to be engaged in this, we'll just do it ourselves.' I won't do that anymore. I say, 'Here are the key milestones that have to occur, and if these don't occur we're not going to implement.'" Johns has been burned too many times to work on ERP without the full commitment of the business unit or function with which he's working. "We [the ERP project team] learned that we weren't able to fix the business problem working alone and we'd end up having to come back and fix it once it went live anyway."

Johns' implementation ultimatums might have been



ignored, he says, had he not had the support of Owens Corning management. Johns says it maintained strong public and private support for the project and it didn't take out its frustrations on the project team when things went poorly.

The New Discipline

At the beginning of the project, Johns and his team trained people to use the system and perform their roles. But after the ill-starred roofing implementation, Johns saw that the training had to be much broader. People entering data had to care a lot more than they used to about whether the data was accurate. It was a matter of time. The old batch systems allowed managers time to check people's work and correct mistakes. The new system did not.



"If you're at a warehouse, and you don't tell the system when a truck is leaving the dock, the truck can still leave, but the customer will never get an invoice for the goods," says Johns. "Accounting won't find out later because the transaction

will never get to them."

Getting people to understand and accept the broader responsibilities they have for the business process post-ERP, and how what they do affects other people's abil-

ity to do their jobs—not to mention the performance of the company as a whole—requires discipline. Today no one gets access to the ERP system unless he or she has been trained and has passed a certification test in using the new processes and systems.

Johns has enforced that same kind of discipline upon his project team. "We do a lot more testing now before we go live to make sure that all the different pieces of the system work together," he says. "At the beginning, we'd say, 'Eh, we have most of what we need to go live, so let's do it,' and add the remaining pieces later." But then it became more difficult to trace

the roots of bugs or performance problems once the new software was added. "All the different development teams have to get to the finish line at the same time so that you can test everything together," says Johns. "If you don't enforce that integrated development, who knows what issues will pop out at you when you go live?"

The Making of a CIO

Johns is almost through the 5-year-old ERP campaign, though Owens Corning seems to buy new businesses as fast as Johns can implement ERP systems—17 acquisitions since 1995. As the new systems have gone live, Johns' team has taken on support duties for them. It came to the point where he owned so much of Owens Corning's infrastructure that the natural next step for management, he says, was to make him CIO. And, in 1998, they did. It's been a big change for Johns. "My role is much more strategic now," he says. "You don't get the opportunity to roll up your sleeves and do a task and check it off and get that instant gratification like you get in project management," he says. "The impact of the strategy stuff isn't as immediate. It's more like a journey than a task."

His superiors have had to tell him to stop rolling up his sleeves and let the people working for him unbutton theirs. "I've had to develop more patience," he says, "and the discipline to let someone else do the work now."

If the slower pace and less direct, immediate problem solving of the CIO role wears on him, Johns says it will be hard to go back to project management now that the biggest pieces of the ERP project are behind him. (The entire company will be on the system sometime next year, he says.) "At this point, I couldn't go back to running a project or a development group; I would be bored out of my mind."

Not even another ERP project?

Johns thinks for a moment then mutters, "Depends on how big it is." **CIO**

Senior Editor Christopher Koch can be reached at ckoch@cio.com.

Johns says it will be hard to go back to project management.

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Can You Do the WWW?

Your ERP system is up and running. Your business has been reengineered. But do you have e-commerce? Not yet if your vendor is SAP.

BY CHRISTOPHER KOCH

or the past five years, the Fortune 500 has been rooting around under the hood of its computer systems, yanking out and replacing all the old parts that won't last into the next millennium. Now, as these companies lift their collective heads from the engine well, blink and squint into the dawning light of the next century, they're seeing nothing but...the Internet. Just when they were beginning to get the engine tuned to perfection, now they have to winch it out of there, haul it onto the Internet, and hook it up to their customers and suppliers. And the billion-dollar question is, Where are they going to get the parts to do all that?

Not from the big ERP vendors. Not yet anyway. This realization is making customers very unhappy. And the biggest ERP vendor, SAP AG of Germany, is taking the biggest lumps from clients, financial analysts and the technical press for not supplying those parts.

How SAP Swept the Field

Acronym parallelism aside, Waldorf, Germany-based SAP is ERP. Beginning in 1972 with software made for mainframe computers, SAP was among the first to reach across the different functional areas of a typical Fortune 500 company—finance or logistics or the warehouse, each of which usually had its own home-built or packaged software—and attempt to tie it all together.

Reader ROI

IN THIS STORY, YOU WILL LEARN

- ▶ How SAP is trying to meet the Web challenge
- ▶ How niche vendors are chipping away at SAP's lead

This, it turned out, was a mammoth undertaking, requiring years of R&D, resulting in a huge database application with thousands of different options for automating the ways companies did things like balance the books or track employee comings and goings. Years of honing the software with its many early customers in Europe gave SAP a tremendous advantage when, in the early '90s, it began targeting the United States with its new client/server software, dubbed R/3.

The appearance of R/3 coincided nicely with the approach of the millennium and the corporate urge to replace aging computer systems. R/3 was more comprehensive and more integrated than anything else on the ERP market, and

sales soared. SAP gained an instant lead on its competitors and never relinquished

Some say the problem is simple: SAP just doesn't get the Internet.

it. SAP currently owns 30 percent of the enterprise resource planning market (its closest rival, Oracle Corp., has 13 percent), according to AMR Research Inc.,

a Boston-based consultancy.

But now there's a problem. After all that work inventing, perfecting and selling ERP to the world, the German company is having a hard time shifting gears from making the applications that streamline business practices inside a company to those that face outward to the rest of the world. Some critics argue that the problem is even simpler and starker: SAP just doesn't get the Internet.

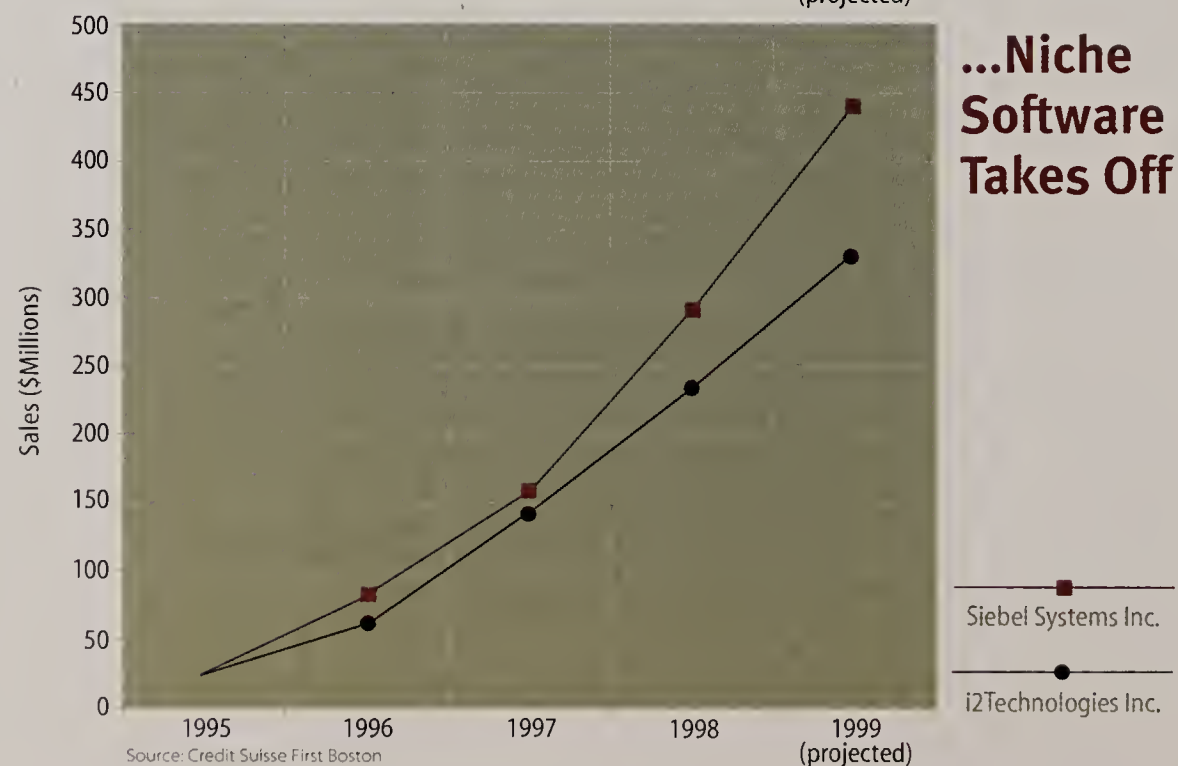
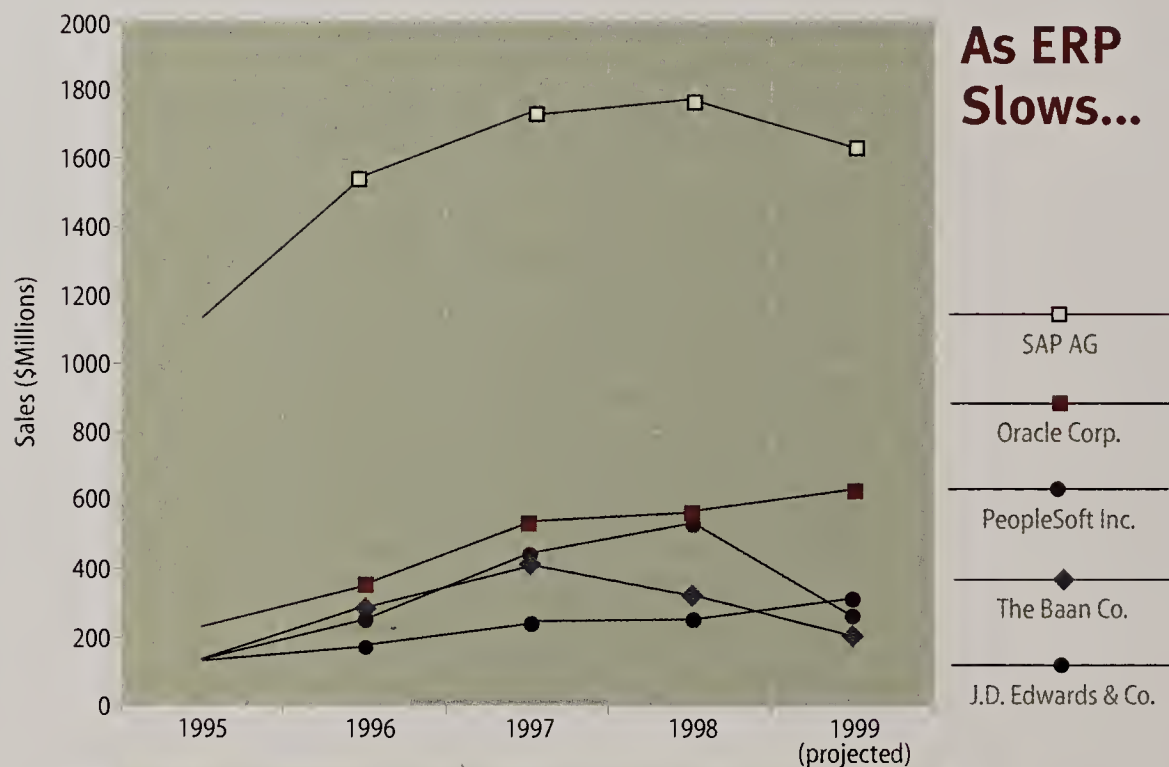
SAP's ERP Versus CRM, etc.

The hottest areas for outward-looking (that is, Internet) post-ERP work these days are electronic commerce, planning and managing your supply chain, and tracking and serving customers. Suddenly, you have to be concerned about the way the software looks (R/3's user screens are notoriously cluttered, drab and complicated), the way it requests information (R/3 requires many hours of training to master) and the technology under the hood (R/3's client/server technology doesn't accelerate to Web speed very well).

So SAP has been working to develop an entirely new lineup of applications that are built from newer, more Internet-friendly technologies than R/3. Collectively called the company's New Dimensions initiatives, these products for supply chain management (SCM), business-to-business electronic commerce, business intelligence and customer relationship management (CRM) are supposed to have friendlier, spiffier user screens, work well with the Web, and be easier to use and maintain than R/3.

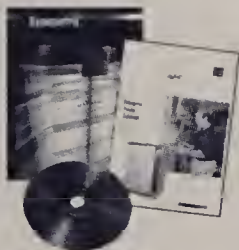
But most of these promised products aren't ready (though SAP was promising they would be soon), and those that are, don't have as much functionality as does software from a whole bunch of smaller, more nimble competitors such as the Irving, Texas-based i2 Technologies Inc., which leads the SCM market, or San Mateo, Calif.-based Siebel Systems Inc., which dominates the CRM market.

A few years ago, these companies would have seemed mere flies on the SAP elephant. The company always ignored its niche competitors, selling the breadth of coverage of R/3 and its tightly integrated structure. But now that most companies have ERP in some form, SAP is being forced to go head-to-head with the niche vendors on the battlefield of pure



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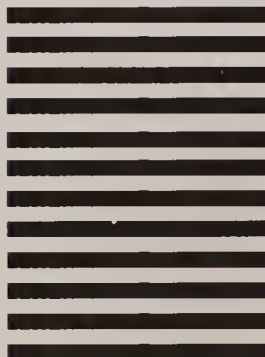
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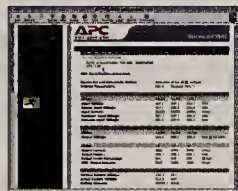
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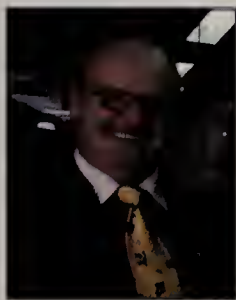


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functionality—something the German giant isn't used to doing. Here, the niche vendors have an advantage because some, like i2 for example, have been perfecting their software for years while SAP was bashing its way through corporate headquarters. Now, it's SAP that's playing catch-up.

Alone Again, Naturally

Unlike U.S. software outfits, SAP has never been comfortable buying or borrowing other companies' software to plug gaps in its lineup. Its developers hunker down in SAP's suburban Munich headquarters and do it all themselves. Earlier this year, under increasing criticism from analysts and customers about the slow pace of its Internet product development, SAP seemed to pull even more tightly into its German shell. Top executives in SAP's U.S. arm left the company for smaller, competing vendors and SAP Co-CEOs Hasso Plattner and Henning Kagermann took personal control of the company's Internet strategy.

Kevin McKay, who became president of the U.S. arm this past March, vehemently disagrees with the perception that control of the U.S. market has shifted back to Germany. "The marketplace that drove the restructuring of the company was the Americas," he says. "The Internet starts here and then moves through Europe and Asia."

"Some people misinterpret the involvement of Hasso [Plattner] and Hennie [Kagermann]," he adds. "I've asked them to become aggressively involved in helping us reposition the company. You need the support and involvement of the directors of the company."

Plattner displayed a rarely seen sense of humility at SAP's annual European trade show in Nice, France, this past May, where he admitted that business-to-business electronic commerce over the Internet had arrived. In a moment that was eerily reminiscent of Bill Gates' mid-'90s pledge to turn lumbering Microsoft Corp. into a fleet Internet player, Plattner claimed to have turned the company's strategy on a dime—or rather, a browser.

"We are concentrating on what's going on between companies now," he said. And what's going on between companies is collaboration online, within

private Web sites that act as gathering places for companies that want to do business with each other. SAP wants to host these gatherings and provide whatever specialized software members need to do business. Like Microsoft before it, SAP is a little late to the Internet game and faces many more ambitious Web-based startups but, again like Microsoft, SAP is counting on its large customer base (20,000 installations and 10 million users around the world, according to the company) to come to its nascent Internet watering holes. It's a strategy the company calls MySAP.com.

SAP has been trying to build these communities by modifying its R/3 software for a wide range of specific indus-

SAP is counting on its large customer base to come to its Internet watering holes.

tries—everything from oil to footwear to government services. But the effort has made an already complex software development process even harder. Essentially, it means rewriting R/3 industry by industry. Most of the industries that are getting or have gotten these souped-up versions of R/3 have experienced delays, software problems and a shortage of SAP consultants sufficiently well-versed in the different industries to be able to modify the software.

Though it has been slow going, McKay sees these industry customization efforts as the linchpin of SAP's Internet strategy. "Someone else can do the Web site, the standardization of the data, and attracting and marketing to the community," he says. "But for the community to be effective, it has to be able to rely on the underlying infrastructure—hopefully SAP."

Meanwhile, the only world left for SAP to conquer is that of the smaller, midmarket (less than \$1 billion) company. But SAP has a bad rep with mid-market companies. Many begged SAP

to call on them during the ERP boom days, but their calls went unanswered as SAP focused almost exclusively on the deeper-pocketed Fortune 500. Smaller ERP vendors like J.D. Edwards & Co. have made a killing by rushing in and being chivalrous after that erstwhile cad, SAP, turned a deaf ear to midmarket entreaties. McKay acknowledges this and says SAP now returns the calls.

"We don't want to lose a deal based on company size anymore," he says. "The days of perhaps being arrogant or having more demand than we can supply are clearly over. We have a new humility."

Even SAP's big clients are still waiting to see it, however.

"SAP can be described in a single word: 'Arrogant,'" says a Fortune 500 CIO and SAP customer who asked not to be identified. "They treat you like you're lucky to be getting the software."

Down, but Not Out

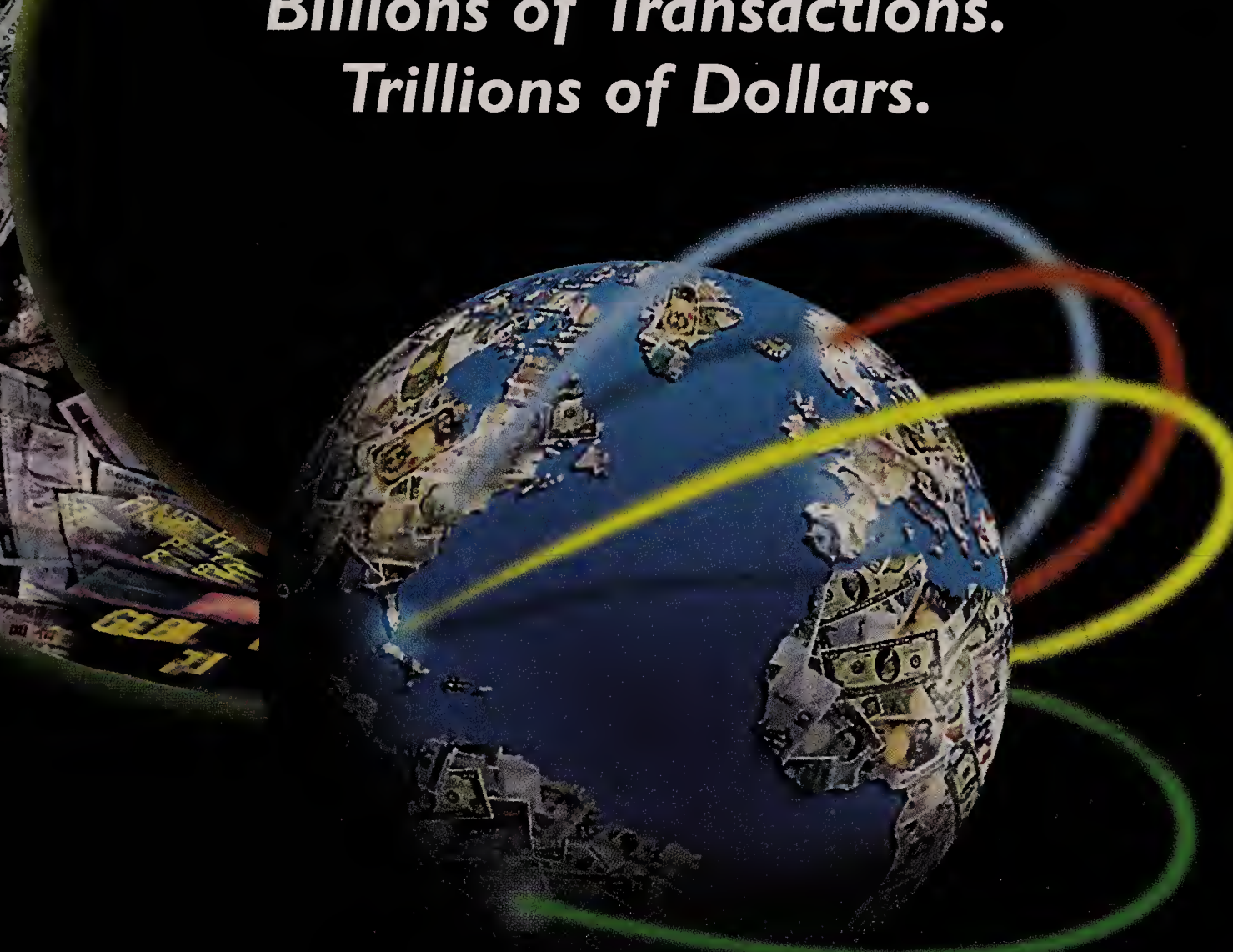
Despite all the upheaval, however, nobody is writing off SAP. Its Fortune 500 customer base is not displeased with what it got from R/3, and many are simply going to wait until SAP fills in the gaps in outward-facing technologies. The only remaining question is, How long can SAP's loyal customers afford to wait for their Internet capabilities and functionalities?

As companies like i2 make it easier to hook their software onto electronic commerce Web sites, and as middleware vendors make it easier for IS departments to hook together applications from different vendors, everyone is beginning to wonder how much longer SAP can convince its customers that it is leading rather than following. SAP customers are watching leading-edge electronic commerce companies like Dell Computer Corp. use the Web to topple established leaders in its industry and wonder if they will be next.

Says Brett Thill, an enterprise applications analyst with Credit Suisse First Boston, "CEOs are looking at this electronic commerce stuff and saying, 'I don't want to get Delled.'"

After all, no one wants to be the wallflower at the WWW dance, standing in a corner, alone in the dark. **CIO**

Senior Editor Christopher Koch can be reached at ckoch@cio.com.



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Gary Banks, former VP and CIO at Xerox



Gary Hamel, chairman of Strategos and visiting professor at the London Business School



Bernard Mathaisel, former executive director and CIO at Ford, now CIO at Solectron Corp.



Steve Sheinheit, executive VP of corporate systems and architecture at Chase Manhattan Bank



Patrick Zilvitis, VP for corporate IT at Gillette

BANKS PHOTO BY FURNALD / GRAY; MATHAISEL PHOTO BY JOHN GILROY; ZILVITIS PHOTO BY JOHN SOARES



The Bigger Picture

For CIOs, long-range planning is an increasingly important challenge.

Business guru Gary Hamel and four IT executives offer their views on doing it well.

BY MINDY BLODGETT

IMPLEMENTING NEW TECHNOLOGIES, responding to user requests—these are inevitable parts of the CIO's job. But the role of the CIO continues to evolve, and one trend is clear: The position is becoming focused less on technical matters and more on strategic planning. A recent study by Korn/Ferry International, an executive search firm based in New York City, highlights this transformation.

ILLUSTRATION BY JAMES KACZMAN

ROUNDTABLE: STRATEGIC PLANNING

Based on the responses of 340 CIOs in the United States, the United Kingdom, France and Germany, Korn/Ferry predicts that CIOs will spend a growing amount of time on long-range planning and less time on more immediate, tactical concerns. In addition to technical and engineering qualifications, today's CIOs need experience in finance, marketing and strategic planning as well. CEOs are paying increasing attention to innovation, knowledge management, customer relationship management and other new business drivers, and IT is indispensable in getting the associated projects off the ground.

CIO recently invited several prominent IT leaders from different industries to discuss the position's ever-growing role in long-range planning. Along with Senior Editor Christopher Koch and Senior Writer Mindy Blodgett, the participants include **Gary Banks**, former vice president and CIO at Xerox Corp., based in Stamford, Conn.; **Gary Hamel**, chairman of Menlo Park, Calif.-based consultancy Strategos and a visiting professor at the London Business School; **Bernard Mathaisel**, then executive director and CIO at Ford Motor Co. in Detroit, and now corporate vice president and CIO of Solectron Corp. in Milpitas, Calif.; **Steve Sheinheit**, executive vice president of corporate systems and architecture at The Chase Manhattan Bank in New York City; and **Patrick Zilvitis**, vice president for corporate IT at The Gillette Co. in Boston. The discussion began with a look at the challenges the four IT executives were facing at the time.

DIFFERENT INDUSTRIES, SIMILAR CHALLENGES

Gary Banks: This is an interesting time for Xerox—it's really moving on into the next generation of the company. One [change] is the emphasis on solu-

tions [rather than] standalone products. Xerox is a lot more than a copier company, and those solutions are global over geographic. So [the company is] moving from a model that was formerly product-oriented and geography-oriented to something that is global and customer-oriented, and that's a major challenge. This is a large organization, and [that] requires rethinking everything.

Bernard Mathaisel: At Ford there are parallels to what Gary has described and then there are some major differences. [Ford is] a world-leading consumer company that offers automotive products and services. And [it is] shifting from the focus on just automotive to one with a heavy emphasis on better understanding consumers and how to take their demands and translate them into vehicles and other services. A major challenge is to prepare the technology and infrastructure to provide the company with its revised business practices.

Steve Sheinheit: Chase is a bank with over \$360 billion in assets. It's in 52 countries and most of the states in the U.S. We have 32 million customers and 73,000 employees around the world. So that's large. When you think about IT strategy, the first reaction is it's got to be integrated with business strategy. For financial services, this is [especially critical] because for a lot of our products and services, technology is the business—the IT strategy is really derived from the business strategy. Now we need to understand how to move our company to an e-business kind of strategy. You really have to change the whole company to understand that it is a 7 by 24 world, 365 days, for customer service, for product capability, for providing services. The information that we have about our customers, our relationships, all has to integrate together so that when you call, we can see your full relationship and everything you do with the bank.

Patrick Zilvitis: Gillette is a global company—we're on the shelves in over 200 countries. And our [corpo-

rate partner] customers, who are the common thread among all of our brands, are consolidating rapidly, moving across country borders.

*"The challenge is,
how do we think
about CIOs not as
chief information
officers but
maybe
as chief
imagination
officers?"*

—GARY HAMEL

We are focused on becoming a single face to our customer, so we've had to really restructure our business processes. Our primary focus has been managing the supply chain across brands and geographics, and we also need the ability to have common business processes on a global basis. So we're about two-and-a-half years into a five-year program to have supply chain management systems on a worldwide basis across brand, across geography. We're also working to be able to capture that data and turn it into information, and then knowledge, to allow us to manage our business better so that we can have a single view of our customers. Our



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ROUNDTABLE: STRATEGIC PLANNING

largest challenge right now is change management: getting the business to sponsor this, getting the business to agree that IT is an investment, not an expense, and that it enables business strategy.

Gary Hamel: I don't have to wake up every day worrying about how to manage the kind of



*"I look at
myself as
an educator
and a*

missionary

as much as

anything else."

—PATRICK ZILVITIS

unbelievable complexities that you guys have to manage, so I start by being extremely humble here about what you are all wrestling with. It's really mind-boggling.

One thing that sets the context for all this is an ever-growing pool of mediocre companies out there and an ever-diminishing pool of truly outstanding wealth creators. So I start with the bias of saying that at least one of the objectives here is to determine how we can use technology to fundamentally drive new wealth creation. I think the question is increasingly, How do you recognize that not only product life cycles are getting

shorter, but strategy life cycles are getting shorter [as well]? The real competitive risk is not inefficiency anymore, it's irrelevancy. The whole focus of value creation and wealth creation will have to move from efficiency to innovation. We are poised at this transitional point between using information technology largely as a way of driving out cost in today's business models and using it as a catalyst for tomorrow's business models.

So for me the challenge is, how do we think about CIOs not as chief information officers but maybe as chief imagination officers, because clearly technology and the things that you are all managing is central to the creation of new business models. And what we see increasingly is that competition is not between products and services; it's between competing business models. I think one of the huge challenges for CIOs is how to provoke that level of dialogue in their organizations.

FOCUSING ON THE CUSTOMER

Sheinheit: As I talk about the issue of changing a company and having the ability to move our technology and our thinking into an electronic kind of world, clearly that [encounters] a certain resistance within the company, so there's a certain inertia. One of our challenges is freeing up the funds in order to invest in those [e-business] technologies. We tend to green the field a bit, in that we take some of the best and brightest and [enable them] to build a new Internet kind of environment. We just recently spun that [e-business] group off and—in a very rapid time frame—[are changing] the whole Web [approach] of the bank. So there is some of that creativity that goes on. But it's not an easy thing to free up capital. Knowledge management is also a critical success factor, but it's really knowledge management about our customer in order to be able to invent new products and services

and provide higher levels of service.

Hamel: I think you've put your finger on almost the pivot between the old industrial economy and the new economy, which is the sense of who is ultimately going to control the customer information. I don't read the tea leaves at Amazon.com, but it seems to me that one of the things they're saying is, "We're not about selling books or actually selling anything else, we're about consolidating all the information about what individuals buy."

One of the interesting things in so many industries, though, [is] that the focus on cost has so undermined the provision of truly outstanding service that I wonder if some companies are already behind the curve in that they have "productionized" the customer interface to a point where it may now be [difficult] to try to rebuild that with customers—to build deep and powerful emotional linkages with them.

Mathaisel: I think the airline industry is a very good example, where perhaps the airlines have lost the focus on consumers and have become so enamored of some of the technology that they're beginning to actually distance themselves from consumers. Try to guess which day, which hour is best to get a fare from New York to Los Angeles. What you discover is that it's become such a game that consumers are getting irritated, and when they get irritated, they get Congress worked up, and when Congress gets worked up, industries are going to get scrutinized, if not suffer.

CIO AS AGENT PROVOCATEUR

Zilvitis: I look at myself as an educator and a missionary as much as anything else. I've heard someone describe it as trying to walk a fine line between being a leader and [being an enabler]. Through your knowledge of information technology, you can enlighten somebody in the business in terms of

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ROUNDTABLE: STRATEGIC PLANNING

how they can either transform or enhance their business with the use of it; but then you have to step back, let them take the leadership role or the championship role and you become the enabler. [The latter] is an interesting role, but if we don't step up to the leadership part, I don't believe anybody [else] in our companies will. We have the unique [ability] to take a look at both sides of the street.

Hamel: I think that is a hugely important role for all of you. I would imagine that most of you from time to time are seen internally as provocateurs.

Mathaisel: If you want to choose a simple but very effective means to transform a company, you take an emphasis such as the one at Ford and say that [it is not] an automotive products and services company, [it is a] world-leading consumer company, and then drive that through all the business models and figure out what that means. But if [the business approach] isn't driven [by] the CEO with some of his perspective and his skill and his motivational ability, it's going to be very hard.

Hamel: How do you bring the whole job of the CIO even closer to the front lines—how do you make a difference in people's lives here? You've all described yourselves as owning processes. I think maybe a decade ago you would've described yourselves as owning the IT infrastructure. I wonder if a decade from now maybe we're going to see you as owning the customer relationship in a way.

Sheinheit: For financial services, to think that the IT function would own the customer relationship stretches things. The issue of what the products and services look like and how to provide them to the customer is a business event. I think the technologists have enough to do. Energizing the business and enabling new ways of doing business, as we're discussing—those are all things we can do.

Zilvitis: One of the challenges that we have is managing information all

along the way, including supporting a launch of a product. Just as an example, I believe that we [in Gillette's IT department] were an integral part of the Mach 3 team in that we brought the Sensor [disposable razor] to market in 1990 and it took us three-and-a-half years to cover the globe. Mach 3 will have launched in every location where we sell products in 18 months. A lot of that has to do with taking it from the lab and putting it on the shelf and every aspect of that. If we weren't involved with the developers and with the manufacturing people, in terms of automating the lines and improving the speed of the lines, and with the distribution arm and in touch with our customers around the world and had shelf space in the right locations in the right stores, all of which is enhanced by our use of information technology, we wouldn't be able to do that. That's not something that is driven by IT, that's something that's enabled by IT. But some of the lead ideas come as a result of the intersection of good business minds with the IT people who know how to put some of these things to work. That's part of our jobs, being that catalyst.

ENGAGING THE BUSINESS

Hamel: What are the things that have worked best for you in terms of getting a deeply engaging conversation with business people where you really can pool the two talents and come up with insights? How do you get that kind of conversation going?

Zilvitis: We meet quarterly with the operating committee of the company: That's the CEO, the COO and the executive vice presidents who run our major business groups. It's my agenda and I typically will bring in somebody from outside Gillette to talk about some new technology or use of the technology. I try to find someone who is provocative, educational—who



*“One thing
that is unique
about IT
is that very
few people
have the
depth and
breadth of
responsibility
that we have.”*

—GARY BANKS

takes away the mystery. So I've gone out of my way to try and make environments where [senior executives] can be comfortable with technology.

A few years ago I introduced [the idea of] having an IT strategic business plan as well that turns into a one-year operating plan and a five-year strategic plan integrated with the business. Once you can get to the point where senior management is really comfortable with discussing these things, and you can lay out a provocative plan that requires some investment on their part—not just intellectual investment but material investment—then you can turn IT into a strategic advantage for your company.

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"Organizations that are not fundamentally IT but that produce other services and products that depend on IT may see a shift of talent much more to the business model enablers."

-BERNARD MATHAISEL

Banks: One thing that is unique about IT is that very few people have the depth and breadth of responsibility that we have. Across geography, across processes and various business units, most of the heads of those units are focused on one particular aspect of the business. Because of the integration and nature of our jobs, we really have to deal with all of it. So there's this opportunity to sell all sides of the business.

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THE CIO OF THE FUTURE

Hamel: How do you think the role of the IT profession is going to be different as we look into the future?

Sheinheit: One of the things that I see potentially changing is the question of skills and skills changes. If you really take a look at the way technologies are evolving, does the CIO and the IT function become more of an integrator of outsourced kinds of functions to bring specialties into the company?

Banks: I see very few people dedicated to IT; I see lots of hyphenated jobs out there. Look at the way the big software packages work—you don't program them anymore. You don't do traditional systems design. The infrastructure is largely outsourced. We may all be financial analysts or product developers or whatever.

Mathaisel: We need to be careful and not let a comment like, "IT professions are dead," appear in a magazine like [CIO]. I think what we can say is that organizations whose business is IT will probably have lots of [IT professionals]. Organizations that are not fundamentally IT but that produce other services and products that depend on IT may see a shift of talent much more to the business model enablers.

Sheinheit: And saying they're dead is a negative way to look at it. I view this [shift] as extremely positive.

Banks: I hear you saying we may be more like architects and less like plumbers.

Sheinheit: Correct. I think that's a wonderful development.

Zilvitis: That would be nice. But I think until some of our vendors take the complexity and all the layering out of the products, we're going to be plumbers too. **CIO**

Senior Writer Mindy Blodgett can be reached at mblodgett@cio.com.

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On the Front Lines

Optimize decision making where the customer meets the business

BY STACIE MCCULLOUGH

IF YOU WORK FOR A LARGE organization, chances are you're no stranger to enterprise resource planning (ERP). Many large companies have spent 30 years automating their operations and the past five years replacing these investments with ERP systems. (For more on this topic, see "ERP-Quake," Section 1, Page 38.) While these systems have produced cost savings in terms of reduced head count, shorter payment cycles and faster inventory turns, they are reaching their limits of competitive value. Not only because every business uses them but also because they fail to continuously increase revenue or affect strategic advantage. Why? Because ERP automates business processes but

doesn't enable organizations to improve them once the software is up and running. In addition, ERP systems typically don't affect the processes that directly contribute to revenue like marketing, sales and customer service. So you can automate the business with ERP, but you can't optimize it.

Despite its other strengths, ERP can't prepare businesses for the wrenching changes that the Internet brings. Only relentless self-improvement will enable them to adapt and thrive in the Internet economy. Therefore, companies need to rethink their businesses to proactively seize market opportunities by targeting the right customer, pricing for customer profitability and delivering one-to-one

customer service. Frontline decision making can help achieve that end.

The Concept

Frontline decision making is the process by which companies automate decision processes and push them down into the organization and out to partners. It includes devising strategies, evaluating metrics, analyzing impacts and making operational changes. Analytic application products are now emerging to support these actions.

Frontline decision making serves business users such as line managers, sales executives and call center reps by incorporating decision making into their daily work. These workers need applications to help them make good operational decisions that meet overall corporate objectives. Today's decision-support tools alone can't fill this need because they fail to give users enough context to make better decisions. Frontline decision making provides users with the right questions to ask, the location of needed data and metrics that translate data into corporate objectives, and suggests actions that can improve performance.

Forrester believes adopting frontline decision-making practices is essential for organizations to continue ratcheting up employee productivity, customer profitability and business success.

Supporting Decisions Throughout the Organization

Despite its name, frontline decision making can assist decision-makers at every level by providing context, metrics and impact analysis

Decision-maker	Type of decision	Example	What the decision allows
Executives and policy setters	strategic decisions to set company direction	set guidelines like capital expenditure and target markets	evaluate effectiveness through metrics like market share
Business analysts, knowledge workers and department managers	tactical decisions to enforce strategic policy	create business rules on departmental basis for workforce plans or budgets	enforce strategic policies like capital expenditure and revenue goals
Line managers, associates and clerks	operational decisions to fine-tune operations	proactively execute daily business decisions	fine-tune strategies on an ongoing basis and replan operations as exceptions occur

SOURCE: FORRESTER RESEARCH INC.

Empower Decision Makers

Decisions at all levels in the organization contribute to the success of the business. But decisions that maximize a sales opportunity or minimize the cost of a customer service request happen on the front lines. Those closest to situations that arise during the course of daily business, whether it be an order exception, an upselling opportunity or a contract that hangs upon a decision, must be able to make effective decisions rapidly, based on context and according to strategies set forth by senior management.

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Forrester View

Today's transactional applications and decision-support tools don't readily enable frontline users to make better decisions. Systems like those from SAP AG and Siebel Systems Inc. don't implement simple decision processes or present data in a way that can be analyzed for complex decisions. Executives may get context from reports and systems created for them (like financial or executive information systems), but these don't provide frontline workers any guidance on daily problems. Meanwhile, traditional decision-support tools and servers from vendors like Cognos Inc., Oracle Corp. and Business Objects SA are intended for experts—those who can access data, slice and dice it, and give it business meaning—unlikely to be at the front lines. So organizations need a new generation of enterprise analytic applications to implement frontline decision making by posing intelligent questions, building business context and determining optimal outcomes.

The Practice

In frontline decision making, every operational process has a corresponding decision process for evaluating choices and improving execution. For example, order management has cross-selling suggestions and a customer service representative could offer additional items to customers based on their specific needs. If my telephone company has frontline decision making, when I call about a service issue, the person I speak to knows I have call waiting. From that and my profile characteristics, the rep is likely to offer me caller ID, explaining that I'd be able to see who a second caller is when I'm still on the line. Having frontline decision making enables the company to make better cross-selling suggestions by tailoring a response to me. A customer service rep without this capability would make cross-selling suggestions based on this week's special, regardless of my individual needs.

Frontline decision making automates simple decisions—like freezing the account of a customer who has failed to make payments—by predefining business rules and events that trigger them. At more complex decision points, such

as inventory allocation, frontline decision making gives managers the necessary context—available alternatives, business impacts and success measurements—to make the right decision. In order for business users to take advantage of ordinary decision support, they have to know the questions to ask, where the information resides and the components of any metric. In frontline decision making, users are given context set up by senior managers (for example, allocate inventory to premier customers

Good decision processes enable a company to constantly evaluate its strategies and fine-tune operations based on recent events and future expectations.

first, then next level and so on) and can be alerted when exceptions arise (for example, orders and demand forecasts show inventory levels will fall short of serving premier customers this month).

Good decision processes enable a company to constantly evaluate its strategies and fine-tune operations based on recent events and future expectations. Organizations should enable call center reps to cross-sell to customers based on a customer's history as in the example above. Or, as in the case of Australia Bank, when certain events occur—such as a customer making a withdrawal 100 percent larger than her average withdrawal—a telemarketer is alerted and informed about how the customer prefers to be contacted. The telemarketer can then reach out to the customer to understand the situation and attempt a cross-sell if appropriate.

Frontline decision making enables organizations to apply metrics, like customer profitability, across the enterprise, thus uniting various functional departments around a common goal. For example, frontline decision making will analyze an existing customer's profitability, and by analyzing recent trends like fluctuations in purchasing or service failures, will suggest ways for sales managers to improve service and retention probability. It may prompt sales managers to offer special rebates or premium

levels of service—offers they would not make to unprofitable customers.

Companies must not only help line managers and knowledge workers make good decisions but also help them understand the impact their decisions have on overall company success. Measuring results of decisions in light of larger goals, and reporting results to the decision makers, is therefore extremely important.

These applications will solve specific problems by packaging into a single browser-based self-service framework

the required business logic (including business rules that map to objectives, algorithms that capture optimization opportunities and sequencing scenarios), metrics (such as return on assets, customer retention rates or product life cycle expectancy) and decision workflow (which ana-

lyzes and ranks alternatives, and ties together logical steps in the decision process so that users can initiate action). These applications need to be browser-based because the audience using them often includes remote users who need to access the most up-to-date information. To be successful, frontline decision making applications must work hand in glove with transactional systems, accessing records of events or pulling business context from sources such as best practices repositories and content databases.

The Market

Many vendors are popping up, the best known being Hyperion Solutions Corp., SAS Institute Inc., Epiphany Inc., NCR Corp. and i2 Technologies Inc. Aside from a few old-line financial application suppliers, there is an open opportunity for vendors with domain expertise and technology excellence. Forrester believes the technology will evolve over the next five years in direct proportion to the transaction systems market.

Phase 1: Collision (1998-2001). In the next 18 months, three types of vendors will fight for a place in the analytic apps market. Tools vendors like Brio Technology Inc. and MicroStrategy Inc., enterprise players like J.D. Edwards & Co. and Siebel, and niche vendors like Deploy Solutions Inc. and AlphaBlox Corp. Inc. will collide as they compete for attention.

Front runners will provide an integrated solution including extraction, analysis, decision workflow and personalized presentation.

Phase 2: Consolidation (2001-2003). This phase will consolidate both technology and functional areas, and niche players like BroadQuest Inc. and Icarian Inc. will become acquisition targets. Technology will converge on standard platforms like Microsoft and Oracle, and market momentum will drive vendors like Hyperion and Parametric Technology Corp. toward complete functional coverage. Vendors must establish analytic platforms and branch out from one functional area to cover all of the front office. During this phase, vendors will support complex, cross-departmental decision processes. That will force them to incorporate best practices like Norton and Kaplan's Balanced Scorecard and external content like Axiom Corp.'s marketing database. Closing the loop between operational decision making and execution will be critical in this phase, giving a leg up to vendors with integration expertise in key transactional apps like those from PeopleSoft Inc. and Lawson Software.

Phase 3: Cohesion (2003+). By 2003 leading vendors will emerge in four functional segments: strategic planning, customer analysis, asset management and product analysis. Companies will be able to buy enterprise analytic apps that optimize strategic planning for executives and translate those strategic plans into organizational metrics and processes that business users can enforce and execute. Finally niche vendors will become industry focused, analytic app leaders emerge and decision-support tools get driven out. Enterprise analytic app vendors like i2 and SAS will achieve dominance by their support of strong systems integrator partners like Ernst & Young LLP and KPMG LLP.

Next Steps for Users

To gain the greatest competitive advantage, companies should immediately begin implementing analytic applications for front-line decision making. The benefits of increased customer loyalty, decreased operational losses and more effective management will outweigh the

cost of implementation in the turbulent early going. When Australia Bank installed NCR's relationship optimizer to make its telemarketing more effective, for example, it resulted in increased sales opportunities. To buffer the risk of vendor failure and technology shifts, companies should choose applications that solve immediate business needs like online selling or sales territory management. As business needs increase, they can add modules or create custom modules on the vendor's technology platform. Companies should choose vendors that can provide value out of the box—browser-based solutions with prepackaged reports, analytic capability and workflow options. These integrated products will take most of the implementation burden off users. Most modules come prepackaged with about 35 reports and decision processes that would be applicable in a given industry, and companies usually add about 10 or 15 that are specific to their needs. Many of these have a "create reports" option that lists all the criteria so that business users could easily create their own.

With an increased focus on analytic applications, companies should reconsider future ERP investments. Analytic applications will force organizations to bring together operational data from many applications into a consistent view. As a result, managers can accurately analyze the business without an all-encompassing ERP platform. Therefore they should reevaluate their need for an ERP system and implement modules only when the added capability creates competitive advantage.

One last thing can't be neglected: To implement decision making effectively, companies must hire middle managers with strong analytic capabilities who can translate strategic plans into operations for the front line. These managers should be able to identify and synthesize metrics to fine-tune front-line operations. And with greater efficiency and coordination with corporate strategy, the front line will help the bottom line. **CIO**

Stacie McCullough, a business applications analyst with Forrester Research Inc. in Cambridge, Mass., can be reached at smccullough@forrester.com.

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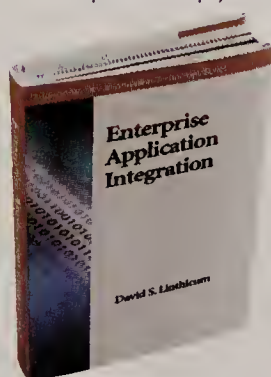
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Edited by Howard Baldwin

Computer, Heal Thyself

New problem-resolution tools aim to diagnose and fix problems from afar

BY ALAN S. KAY

In the first installment of this two-part series (see "Reaching Out for Help," CIO Section 1, Oct. 1, 1999), we looked at tools that allow internal users and customers to solve their own technical problems by consulting technical support data and dynamically ordered FAQs on company Web pages. Self-help technical support may work well for the 80 percent of calls that are routine. But what about the other 20 percent?

PROBABLY THE ONLY PERSON who worries more about technical support than the traditional CIO does is someone like Ron McIntire, vice president of help desk operations for CompuCom Systems Inc., a Dallas-based provider of technology products and services. Since CompuCom provides help desk services for a range of companies, McIntire is concerned about thousands upon thousands of desktops. He and other CompuCom officials have expended much time and energy thinking how to best serve both their clients and their profits. Rather than just focus on keeping technical support costs in line, McIntire recalls, they decided to go one step further and look strategically at ways to reduce the total cost of ownership of a computer. Their first tactic: the burgeoning field of "call avoidance" technology.

It's a simple theory: The fewer support calls a company has to field, the more money it saves. A simple problem can take anywhere from five minutes to three hours to resolve, according to Christopher

Hoffman, worldwide director of software services at International Data Corp. (a sister company to CIO Communications Inc.). One that's more complex can take hours and sometimes days, and the incident can cost the company as little as \$25 but as much as \$200. Seventy percent of that cost is labor.

End-user self-help is limited as a call avoidance tool, not only in the problems it can address but also in the people who will use it. As Aberdeen Group Inc. Senior Research Analyst Chris Martins notes, a large class of users aren't interested in or willing to pursue self-help; they just want the problem fixed. He adds that for certain kinds of problems that require getting under the hood of the system—modifying registry entries, for example, where a misstep can render a computer unusable—the IT staff probably doesn't want the user doing the fix without guidance anyway.

Is there a middle ground? Perhaps. New diagnostic tools are designed to diagnose the problem, and perhaps even fix it, either automatically or with limited user involvement. If self-repair proves to be impossible, these



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tools also shorten the service call by reporting to the help technician the diagnostic work it has already done.

Clean-Hands Fixes

Technology is racing to save companies money in support costs while keeping users from having to get involved. One category of solutions is software that will reside on a client's desktop computer, monitor its configuration and operations, and act when—or ideally before—a problem develops.

Fujitsu PC Corp. in Milpitas, Calif., plans to launch a pilot project that runs Aveo Inc.'s Attune on its laptop computers. This system includes a small agent that will monitor the computer and warn users if it detects an impending problem. If it does spot a problem, it will display a notice and, depending on the problem, may offer a fix.

John VanZandt, Fujitsu PC's CIO and vice president of engineering, anticipates that installing Attune will provide a better customer experience and improve customer satisfaction. He says that the company explored other available support utilities, but "most solutions we saw looked at a problem after the fact and relied on the customer to know how to look for the solution. Our expectation in that situation is that most customers will call first and ask questions later."

Attune takes inventory of the laptop's hardware and software configuration. When the computer is next connected to the network, the agent downloads a set of alerts, each one describing potential problems. As the computer is used, Attune runs invisibly in the background, monitoring operations for the preconditions specified in any of its alerts. New alerts, as long as they are relevant to that particular notebook, are loaded whenever the user connects to the network. When a specified set of conditions occurs—for example, the user double-clicks on an icon to load an application for which a key DLL (dynamic link library) is missing—the software cautions the user that he or she may face a problem. The alert can also offer a remedy or direct the user to a Web location for a fix.

VanZandt says Fujitsu wants Attune to initially monitor standard Windows

Say the Magic Word

Speech recognition technology hits the Web

BEFORE TOO LONG, THE traditional company's Web and intranet site may be transformed by an old device, providing your customers and end users with even easier access to the information they need. All you have to do is say the magic word: VoiceXML.

VOICEXML

This new programming language is the progeny of the VXML Forum (www.vxmlforum.org), an industry group composed of AT&T Corp., IBM Corp., Lucent Technologies Inc. and Motorola Inc. VoiceXML combines the best feature of extensible markup language (XML)—the ability to tag HTML content in a way that describes its functionality—with speech recognition technology. It allows mobile professionals to use a phone to obtain any information stored on their PCs, servers or intranets that contains VoiceXML tags, according to David Unger, manager of product strategy and development in AT&T Corp.'s consumer markets division.

Users can access Web-based information by dialing into a platform that is connected to the phone network and the Internet, entering a personal identification number and choosing from a menu, which might include stock quotes, weather forecasts or e-mail.

If a user chooses weather, the voice or touch-tone command is transferred to a Web server and the forecast comes back in VoiceXML. Voilà, the forecast—sunny with a high of 65—is delivered to the user's ear either in a text-to-speech format or as an audio clip. With VoiceXML, professionals will be able to check their e-mail in addi-

tion to voice mail and reply to it over the phone. "It is tailor-made for speech input, touch-tone input and text-to-speech conversion," Unger says.

VoiceXML will also facilitate call center operations and development because, according to Unger, call centers use the same back-end data store as a company's Web site. The call center's interactive voice response (IVR) unit can be written in VoiceXML, and because it is similar to HTML, the same developers can write IVR and Web applications. Since the VoiceXML pages reside on a Web server, CIOs can use common equipment for the two services. "The critical thing is that it [VoiceXML] meshes with their existing back end so that CIOs don't have to rearchitect it. It's just a different front end," he adds.

Though it's still in a rudimentary phase (the initial specification was posted on the Forum's Web site last



August and a 1.0 version is scheduled to be submitted to the World Wide Web Consortium later this year), VoiceXML has the potential to revise our notion of the Web and how we use it. By establishing the prosaic telephone as a primary means to access the Internet, VXML might even take the computer out of the Web.

—Meridith Levinson

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problems. As the company identifies other problems that generate frequent support calls, new alerts will be created and downloaded to the computers.

Since Attune is using the PC's CPU and memory as it runs in the background, it could potentially affect performance and battery life. But VanZandt notes that his tests didn't reveal any degradation. Beta versions of the tool did reduce battery life, but he says that problem was improved substantially in later versions. Another drawback: It's only effective for known problems.

Automatic Diagnosis

At CompuCom, McIntire has deployed a new tool from Palo Alto, Calif.-based Tioga Systems Inc. that works a little differently from Aveo's tool. Tioga's auto-diagnosis tool, called the Self-Healing System, records all the components of a desktop PC, including the Windows operating system and the file, driver and other dependencies of designated applications. When the PC is booted or runs any of those applications, it checks for unauthorized changes in configuration. If it detects any, the agent will automatically undo them, using data it has stored either locally or on the network to return the unit to a known operable configuration. The system thus doesn't require a database of problems and solutions; faced with a problem, it simply rolls back the malfunctioning software to the operating state specified by the company's IT department.

If the company prefers to involve the user, the software can run its repair agent in a browser window, allowing it to interact with and provide repair guidance to the user. It can also deliver diagnostic data to help desk personnel and support remote repair.

Initially, CompuCom has installed 800 copies of Tioga's tool, and McIntire is thinking about offering it as part of the company's solutions package in its help desk outsourcing contracts. Setup is simple, he reports, and the company can easily use the tool to enforce standard configurations for either the entire PC or for selected applications. McIntire adds, "It's very valuable in reducing calls to the help desk by providing means for users to easily repair many of their typical issues without other assistance. This is our primary goal." Another advantage: Companies running the Tioga tool can also use it to safeguard existing Y2K compliance—once they know a computer is compliant, no unremediated applications can be loaded unintentionally.

Making Support Easy

The diagnostic tools in this new category are not just for hardware; they work with software applications as well, whether custom built or off-the-shelf. As part of its support maintenance agreement,

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Remote Access

ONE OF THE BUGABOOS OF mobile computing is having to dial into the user's desktop system for e-mail and other updates. American Systems' PC Remote 1.0 wants to give remote users a variety of options for access, whether they're dialing in across a LAN, the Internet or through a laptop serial connection or modem. Users are assigned user names and passwords, and the IT department can create connection "profiles" for frequently used connections. The host-access software can be automatically loaded when Windows starts so that users can see file systems on the remote machine and have full control of its keyboard and mouse.

PC Remote also allows users to determine who can access their computers and whether that person can transfer files between a remote machine and the desktop. Users can copy data to the clipboard on the remote computer and have it appear in the clipboard of the controlling computer. They can also choose between image quality and speed as well as pause data to conduct other tasks. The software runs under Windows 95, 98 and NT 4.0. It requires 2MB of disk space and 8MB of RAM. The price is \$49.95. For more information, call 817 485-6547 or visit www.americansys.com.

Crash Recovery

WHEN SYSTEMS CRASH, a natural reaction is the desire to turn back time to before the problem occurred. UniTrends Software Corp. hopes to get as close to that scenario as possible with its PC ParaChute automated backup and recovery software for any network-attached Intel-based PC. In addition to backing up PC-stored data, PC ParaChute enables a network administrator to fully recover a system that crashes into fully functioning condition without reinstalling the operating system, add-ons, registry, upgrades and software packages. The software protects all information in the file system, including the partition table and startup instructions.

It also schedules system backup to a central server and verifies that data has been protected to the bit level. All backup and protection data is logged and cataloged so that administrators can reference the information locally or remotely. The software also optimizes free space to reduce the volume of data transfers across the network for better bandwidth utilization.

Using UniTrends' unattended scheduling software (called BackUp Professional), IT staff can schedule PC ParaChute backups on PCs running Windows 3, 95, 98 and NT, Solaris Intel, BSD, Linux, Novell NetWare, UnixWare and SCO operating systems. The price is \$500 for 10 copies. For more information, call 843 626-2878 or visit www.unitrends.com.

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PeopleSoft Inc. offers a diagnostic tool called Duet, from Austin, Texas-based Motive Communications Inc., because it supports a range of problem-solving interactions, from self-repair to remote help. For the Pleasanton, Calif., ERP software developer, good support services mean good customer relationships. "We need to make support easy for the customer as well as to keep tools available for our analysts to be able to support complex applications," says Gladys Barnes, former director of support services at PeopleSoft's Global Support Center. PeopleSoft's technical support system consists of a client module that resides on the customer's servers or PCs, a middleware server and a help desk client. The system ties into the Vantive Corp. support software that the company uses.

Unlike Attune, the Duet client doesn't constantly monitor the PC, and it doesn't provide proactive warnings. Instead, a customer with a problem clicks on the PeopleSoft eSupport Assistant icon and specifies a problem with a running application. The client agent then downloads and runs a troubleshooting procedure for that application, generating diagnostic data that is fed back to the server. Using Motive's help desk console, a support analyst can then diagnose the problem, check the configuration and state details of the PC, and gather any other information needed to resolve the problem. In a later phase of the project, PeopleSoft will also deploy a Motive component called ActiveContent, which provides procedures for addressing specific problems and even self-service support, so that users can diagnose and fix problems themselves.

Barnes is delighted with the capabilities of Duet. It allows the company to collect data proactively and seek out ways the information can be used to add value, such as notifying an administrator that a particular upgrade hasn't been loaded.

These tools are just the beginning. Aberdeen's Martins sees a promising array of support tools rolling out over the next several years as vendors target different aspects on a continuum of customer care that stretches from self-healing through facilitated diagnosis to remote repair. These tools are being designed to allow companies to simplify routine repairs, empower customers and end users, and cut help desk and call center costs, all the while conveying the message that the company cares about its customers. As CompuCom's McIntire notes, the earlier you can catch and solve a problem, the better job you're doing for your company—and your bottom line. **CIO**

Alan S. Kay covers business and consumer technology from San Francisco. He can be reached at ask@well.com.

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Low-Bandwidth Videoconferencing

IF THE BANDWIDTH REQUIREMENTS of PC-based videoconferencing have been holding back your desktop deployment, one company says it can deploy business-quality desktop videoconferencing with approximately half the bandwidth requirements. The key to Sorenson Vision Inc.'s EnVision is a unique application-specific integrated circuit (ASIC) design that needs lower host computer requirements. While other desktop conferencing solutions might require a 400 Mhz Pentium II, EnVision can run on a 90 Mhz Pentium CPU.

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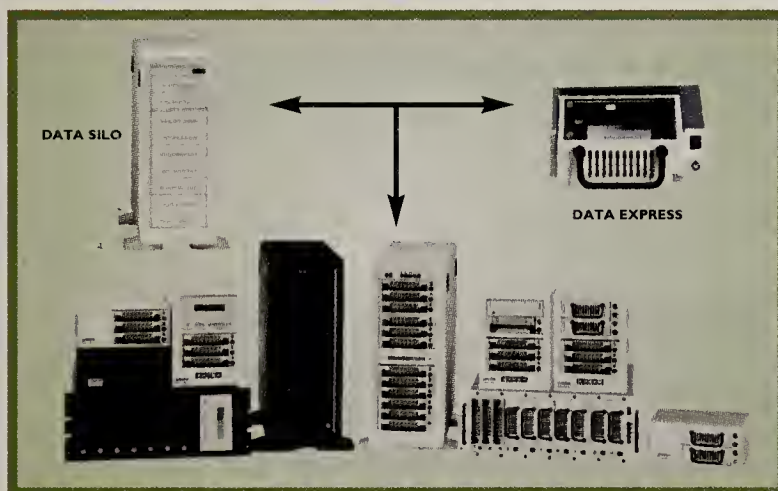
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ShopTalk

Trend Micro's Eva Chen on Battling Software Viruses

How do you keep pace with the constant proliferation of viruses?

There's a big change in the antivirus field. The industry used to play the numbers game—it was about how many viruses you could catch. But recently, it has become a response-time game. Viruses travel on the Internet faster than most antivirus companies can send out the vaccines or solutions. The problem is not whether you [can] catch the virus, it's how to put the vaccine out to your users faster than they get the virus. Within three hours, millions of users got the Melissa virus through the spamming e-mail. The challenge for antivirus companies is not only updating the product architecture, it's having the trained antivirus engineers to deploy your solution to millions of people very quickly—and go onsite to a company to do it if necessary.

What trends in the field of cybervandalism do CIOs need to be most wary of?

The new trend in the hacker world is collaboration. Virus writers, hackers and e-mail bombers used to be in

different camps and they didn't talk to each other. But now I'm starting to see mixed attacks, in which the different camps are collaborating together. For example, there is a virus called Back Orifice that combines a harmless looking e-mail bomb, a virus-spreading mechanism and a software agent. It doesn't do any traditional virus damage like destroy a hard drive. It sits there on the network so that it can steal important information and send it back to the hacker over an extended period of time. The hacker gains permanent access to your most important files.

Whenever network administrators get a virus or a hacker infiltration, they need to be aware of what

the virus actually did and whether it left a hacker agent in the network.

Hackers are often depicted as technical whiz-kids gone wrong. Do you think their image has been glorified in the media?

I know some people think that hackers or virus writers are very good technical people, and a reporter even asked me once if I would consider hiring an engineer or a person who writes this type of code. The answer is

no! It's not difficult to do all that damage, because hackers write code without any error controls. They don't care about crashes, scalability issues or performance. But when repairing the damage, [you need to ensure that] the repairs are stable and reliable. A hacker is like someone who uses a hammer to destroy a car—doing damage is easy, it's putting the car back together that's the hard part. I think people need to be educated that from a technical standpoint, hacking is not much of an achievement.

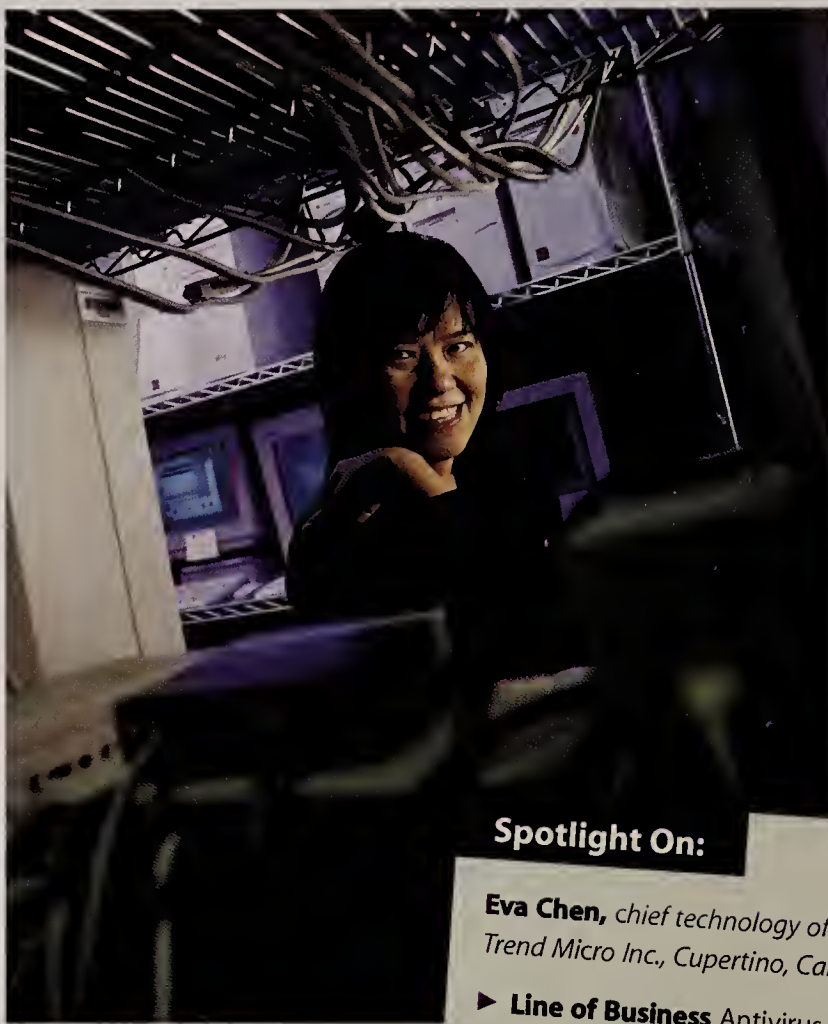
What attracts you to the task of thwarting would-be hackers?

It's like playing chess. You guess their next move, and you try to move first. That part of the challenge has always interested me.

How has your eclectic array of experiences (science-fiction writer, sports journalist, software developer and business book author) affected the way you approach your job as CTO?

Science fiction takes a lot of imagination—it's about seeing the future. All these different jobs trained me to not be afraid of approaching new fields, and that has really helped me because technology changes every day. If you're not open-minded and you're afraid of new technology, then you can't do your job well.

—Daintry Duffy



Spotlight On:

Eva Chen, chief technology officer, Trend Micro Inc., Cupertino, Calif.

- **Line of Business** Antivirus software developer
- **Bio** Cofounded Trend Micro in 1988, heading the company's Asian office in Taipei; took over U.S. operations in 1995
- **Challenges** Protecting companies from a growing legion of cybervandals

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